

**CAPRON TRAIL COMMUNITY DEVELOPMENT DISTRICT  
ST LUCIE COUNTY, FLORIDA**

**ANNUAL REPORT OF THE DISTRICT ENGINEER  
JUNE 30, 1998**



***CAPRON TRAIL COMMUNITY DEVELOPMENT DISTRICT  
ST. LUCIE COUNTY, FLORIDA***

**ANNUAL REPORT OF THE DISTRICT ENGINEER  
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This Annual Report is prepared and submitted in accordance with the requirements of Section 11.17 of the Master Trust Indenture for the Capron Trail Community Development District (District), Series 1990 Water Management Benefit Tax Bonds.

**Section 1: Review and Evaluation of District Facilities**

On June 26, 1998, an on-site review of District surface water management facilities was conducted by Lindahl, Browning, Ferrari & Hellstrom, Inc., staff. A map showing the locations of the facilities is included as *Exhibit A*. The following improvements were included in the review:

- \* Water Control Structures S-1, S-3, S-4, S-4A, S-5, S-5A, S-6, S-6A, S-7, S-8, S-8A, S-8B, S-10, S-10B, S-10C, S-11, S-11B, S-15, S-15A, S-16A and S-17
- \* Canals C-1, C-1A, C-2, C-3, C-4 and C-5.
- \* Pump Stations PS-1, PS-1B, PS-1C, PS-2A, and PS-2B.
- \* Reservoir No. 1 Dike and Reservoir No. 2 Dike. (See Ardaman Report, *Exhibit B*.)
- \* Perimeter Canal and Perimeter Dike.

Included with, and incorporated as a part of, this report are two documents prepared by others:

- *Exhibit B*: A report dated March 23, 1998, prepared by Ardaman & Associates, Inc., signed by John E. Donahue, P.E. This is the annual inspection report of the impoundment dikes around Reservoirs No. 1 and 2, and around the two wetland preserves, and is required by the South Florida Water Management District (SFWMD).
- *Exhibit C*: A report dated January 12, 1998, prepared by Milleson Environmental Consulting, Inc. This is the fourth of five annual reports required as a condition of the construction permit issued by the SFWMD for the project. The purpose is to monitor and assess the change in the plant communities within the wetland preserves.

The following observations were made on June 26, 1998, at the on-site review of the District surface water management facilities:

1. Canal C-1 between the Florida Turnpike and Structure S-1 is filled with aquatic weeds.
2. The northerly one-third of Canal C-4 is filled with aquatic weeds.
3. Canal C-5 is filled with aquatic weeds for almost its entire length.
4. There are limited areas along the shoreline of both Reservoir No. 1 and Reservoir No. 2 that are supporting aquatic weeds, including cattails.
5. PVC pipes installed as berm drains at intervals around the dike exterior of both Reservoir No. 1 and Reservoir No. 2 have resulted in the erosion and removal of dike material. In some cases the loss appears to be substantial.
6. The erosion around Pump Station No. 1 at the north end of Reservoir No. 1 has not been corrected, as recommended in the Ardaman & Associates report of 1997. The reported erosion at the east end of the station has continued, and is undermining the fuel containment structure. There also is erosion at the west end of the station.
7. The timber walkways at Structures S-4A and S-10 are deteriorating, with the northernmost walkway on S-10 having failed.
8. The overflow structure on the east side of Reservoir No. 1 does not appear to conform to the original design, and a grate appears to be lodged inside the structure about two feet from the top of the overflow crest.
9. There is severe corrosion of the pinion shaft on many of the gate lifts used to raise and lower gates at the water control structures. (The pinion shaft is the connection point for the crank.)

**Section 2:**  
**Recommendations for Operation, Maintenance and Repair of the System**

In addition to continuing standard operation, maintenance and repair of the surface water management system, the following specific recommendations are offered to the Board of Supervisors as action that should be taken now, or action that can wait until Fiscal Year 1999. References used are keyed to the numbering system used in identifying deficiencies under Section 1, above.

***Work To Be Undertaken Now***

- Items No. 1 & 2: Aquatic weeds should be removed from all areas of both C-1 and C-4. Both canals are integral elements of the basic system. C-1 is the sole conveyance system for the entire project, and C-4 is the primary canal accepting discharge water from Reservoir No. 2. Each canal must be cleaned to function as designed. A combination of mechanical and chemical cleaning is recommended, depending upon the conditions at the time of cleaning.
- Item No. 5: The loss of material on the outside of a dike can result in a potential increase of seepage through, and structural damage to, the dike. The areas around the intake end of these berm drains should be re-inspected by either Ardaman & Associates, the dike designer, or by LBFH, with remedial action recommended and taken.
- Item No. 6: The erosion on the east end of Pump Station No. 1 that is undermining the fuel containment structure must either be corrected, or the fuel containment structure relocated, as recommended in the Ardaman & Associates report. The erosion on the west end of the station should be stabilized.
- Item No. 7: All three-timber walkways at Structures S-4A and S-10 should be replaced. To prevent a reoccurrence of deterioration, a rust-resistant material is suggested.
- Item No. 8: The top of the overflow structure should be checked to assure it is not higher than allowed under the SFWMD permit, and to protect the dike from overtopping and subsequent failure. Also, the intake riser should be cleared of all obstructions to permit discharge at the design rate.
- Item No. 9: Corroded pinion shafts on all structure gate lifts should be replaced with non-corrosive shafts, or same-material replacements should be protected from corrosion after replacement.

### ***Special Work To Be Undertaken During FY 1999***

- Item No. 3: Although the entire length of C-5 could be cleaned now of all vegetative material, cleaning can wait because it serves primarily a non-sensitive agricultural area. However, if funds are available, it would be better to perform this vegetative cleaning work at the same time C-1 and C-4 are cleaned. Mechanical cleaning is needed, with chemical application following later.
- Item No. 4: Aquatic weed control work should be performed within both reservoirs at the same time the same the work is performed on Canal No. C-5.

### ***Standard Work To Be Undertaken During FY 1999***

A standard and continuing program of operation, maintenance and repair should include:

1. Maintenance for the dike around the reservoirs consistent with standard practice for repairing minor erosion and for supplemental grassing, as needed.
2. Maintenance on all canals, water control structures, culverts and the perimeter dike, as necessary.
3. Continued observation and evaluation of suspected seepage under Structure S-5.
4. Servicing and repair of pump station engines and pumps, consistent with the recommendations of the manufacturer or fabricator.
5. Evaluating District surface water management facilities by District personnel and the District Engineer immediately following any severe weather event that may impact those facilities.
6. Removal of floating vegetative mats at outfall structures as they form (e.g., S-5).
7. If not already covered above, performing remedial work as detailed in the Ardaman & Associates, Inc. report, attached as *Exhibit B*.
8. Securing bids from contractors for the annual control of aquatic weeds in all canals and both reservoirs. These bids could include the work outlined above as needed now, and as needed in the coming fiscal year.

### **Section 3: Budget Estimates for Operation, Maintenance and Repair of the System**

For FY 1999 budgeting purposes, the following estimates are offered for performing the work outlined above.

|           |  |                  |
|-----------|--|------------------|
| <b>A.</b> | <b>Work To Be Undertaken Now (with FY 1998 Funds):</b>       | <b>\$ 25,000</b> |
| <b>B.</b> | <b><u>Special</u> Work To be Undertaken During FY 1999:</b>  | <b>\$ 16,500</b> |
| <b>C.</b> | <b><u>Standard</u> Work To Be Undertaken During FY 1999:</b> | <b>\$133,300</b> |

It is recommended that the work specified as “work to be undertaken now” be performed in this fiscal year, if funds are available from this year’s maintenance budget (FY 1998). If those funds are not available, or if that work is not performed this fiscal year, then that \$25,000 should be **added** to next year’s budget (FY 1999).

Also, the suggested budget for (C), above, is detailed below. It presumes a more aggressive aquatic weed control program for the District. Any modification of this suggested budget should be reflected in the total for item (C).

#### ***Itemized Budget for Standard Work To Be Undertaken During FY 1999***

| <b><u>Description</u></b>        | <b><u>Suggested<br/>Budget<br/>FY 1999</u></b> |
|----------------------------------|--|
| Field Manager (part-time)        | \$15,000                                       |
| FICA Taxes                       | \$ 1,200                                       |
| Employee Benefits                | \$ 3,600                                       |
| Insurance                        | \$ 6,000                                       |
| Rental Equipment                 | \$10,000                                       |
| Equipment Repair and Maintenance | \$20,000                                       |
| Fuel and Oil                     | \$40,000                                       |
| Fertilizer (erosion control)     | \$ 5,000                                       |
| Supplies                         | \$ 1,500                                       |
| Engineering                      | \$10,000                                       |
| Aquatic Weed Control             | <u>\$21,000</u>                                |
| Estimated Standard Work, FY 1999 | \$133,300                                      |
| Estimated Special Work, FY 1999  | <u>\$ 16,500</u>                               |

|   |
|---|
| <b>Estimated Total, All Work, FY 1999 = \$149,800</b> |
|---|

#### **Section 4: Insurance Protection for Works of the District**

The insurable elements of the surface water management system include pump stations, water control structures, culverts, and appurtenances. Earthen facilities, including canals and dikes, are not insurable.

The insurable works of the District are listed in *Exhibit D*. The estimated replacement cost for insurable works of the District is \$2,047,000. This represents a three percent increase over last year. The present coverage insured under the insurance program sponsored by the Florida League of Cities is \$1,987,000. It is recommended that the District Board of Supervisors increase the insurance coverage to \$2,047,000, which represents the estimated replacement cost value.

The amount budgeted in FY 1998 for this premium was \$6,000 as estimated by the Florida League of Cities, Inc. Increasing coverage to the estimated replacement costs of the insurable works may result in a corresponding increase in the premium. The insurance carrier, the Florida League of Cities, Inc., must determine the actual amount.

Respectfully submitted,



Richard B. Hellstrom, P.E.  
District Engineer, Capron Trail  
Community Development District  
June 30, 1998

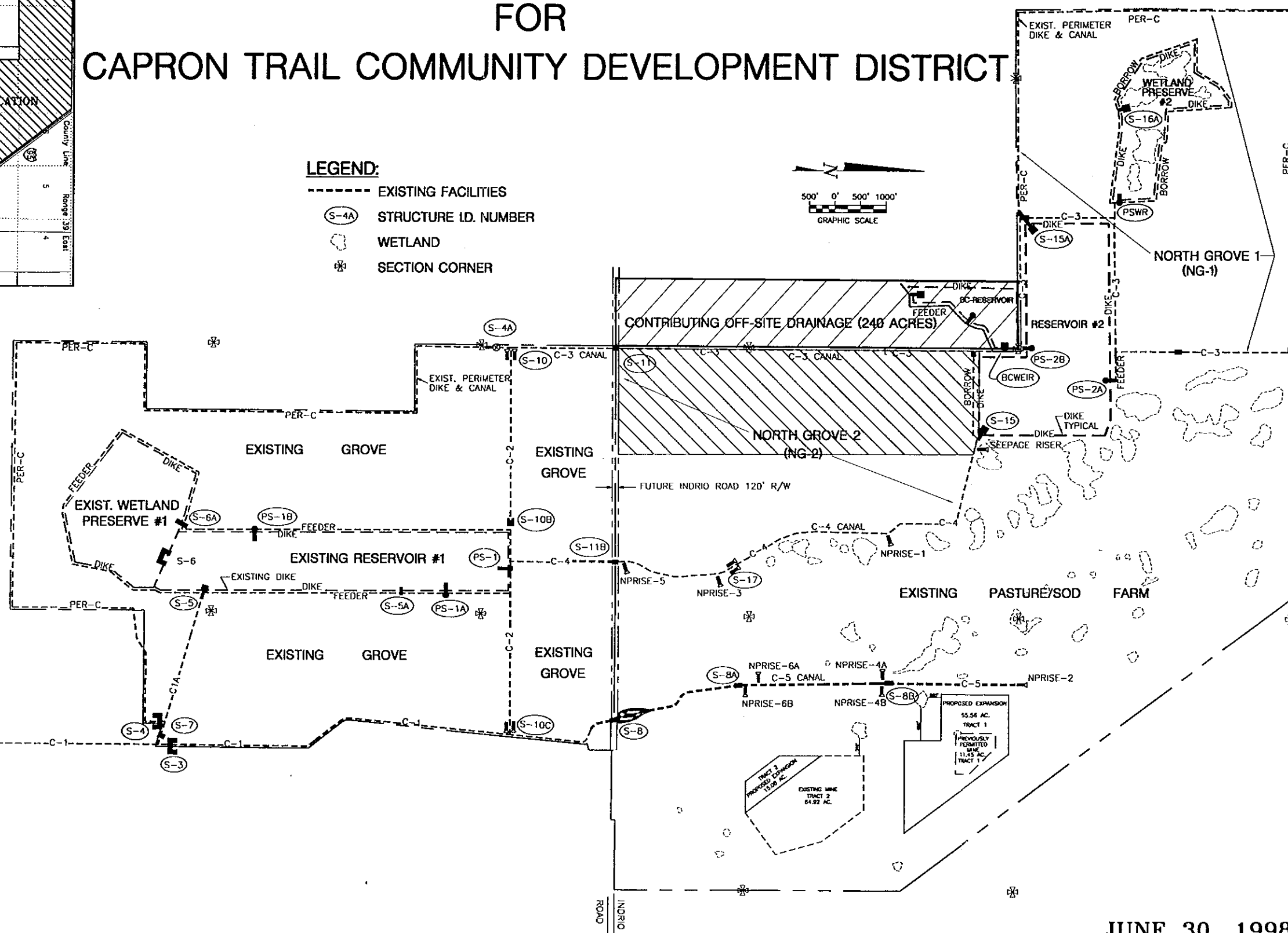
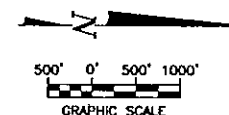
RBH/kb

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The map displays a grid of sections numbered 1 through 36. A large area in the upper right is shaded with diagonal lines and labeled "SITE LOCATION". A north arrow is in the top right corner. The map includes labels for "FLORIDA TURNPIKE", "INDIO ROAD", and "County Line". A scale bar at the bottom indicates distances from 0 to 10 miles.

The map shows a network of water distribution lines. A main line, labeled 'C-25', runs vertically on the left side. A branch line, labeled 'C-1', extends horizontally from the main line to the right. A shaded rectangular area, representing the S.F.W.M.D. boundary, is located in the upper left quadrant. Within this shaded area, two locations are marked: 'S-99' and 'S-1'. To the right of the 'C-1' line, a vertical line is labeled 'L-20 CANAL'. Further to the right, a horizontal line is labeled 'STATE PARKWAY'. The map is oriented with North at the top.

----- EXISTING FACILITIES  
 (S-4A) STRUCTURE I.D. NUMBER  
 WETLAND  
 SECTION CORNER



**JUNE 30, 1998**  
**EXHIBIT A**

**Lbfh**

**Lindahl, Browning, Ferrari & Hellstrom, Inc.**  
CONSULTING ENGINEERS, SURVEYORS & MAPPERS

2222 COLONIAL ROAD, SUITE 201  
FORT PIERCE, FLORIDA 34850  
(361) 461-2430 • FAX (361) 466-1225

WEST PALM BEACH   JUPITER   STUART   FORT PIERCE   OKEECHOBEE

LATEST REVISION DATE: 06/30/98  
DRAWN BY: RAH DESIGNED BY: FRJ  
DRAWING NO. 91-033\CTCOPRES.DWG

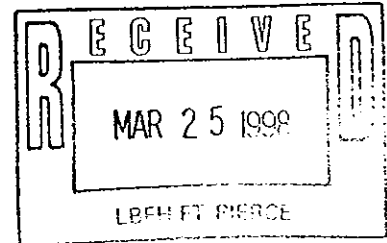




**Ardaman & Associates, Inc.**

Geotechnical, Environmental and  
Materials Consultants

File No. 98-5554  
March 20, 1998



Capron Trail Community Development District  
10300 NW 11th Manor  
Coral Springs, Florida 33309

Attention: Mr. Darrin Mossing

Subject: Annual Above Ground Impoundment Inspection Report  
Reservoirs #1 and #2 and Wetland Preserves #1 and #2  
Capron Trail Community Development District  
St. Lucie County, Florida

Dear Mr. Mossing:

In accordance with authorization given to us by Mr. Philip Strazzulla of Strazzulla Brothers Company, Inc., Ardaman & Associates, Inc. has completed the annual inspection of Reservoirs #1 and #2 and Wetland Preserves #1 and #2 at the Capron Trail Community Development District. Our field inspection services were performed on March 16 and 19, 1998. The work included performing a cursory inspection of the following areas and items of the reservoir construction: interior slopes, exterior slopes, top of banks, cursory features of pump stations and water control structures, and the existing water elevation and high water elevation mark on the interior slopes of the reservoirs. The results of our inspections are presented below.

**RESERVOIR #1**

**Interior Slopes**

In general, the interior slopes on the north, east and west sides of the impoundment appeared to be satisfactory. Although the interior slope of the south side of the impoundment has been steepened by wave erosion, the vegetation growth just inside this side of the reservoir appears to provide adequate protection against significant future wave erosion. All sides exhibited shallow ruts caused by rainfall runoff erosion, as well as small tree/brush growth. The shallow ruts should be monitored, and should be filled, re-shaped and grassed, if necessary, during routine maintenance operations.

### Exterior Slopes

The exterior slopes of the impoundment appeared to be in a satisfactory condition. The land surface between the toe drains on the east and west sides of the impoundment need to be graded so as to minimize the ponding of runoff in these areas, and to allow the runoff to properly flow into the toe drains.

### Top of Banks

The top of banks of the impoundment appeared to be in a good condition and properly maintained. Shallow ruts detected during routine mowing events should be monitored and filled as needed.

### Pump Stations and Control Structures

The cursory features of the pump stations and control structures appeared to be satisfactory.

We note that significant erosion is beginning to undermine the secondary containment structure around the fuel storage tank located just east of the Pump Station PS-1 rim ditch structure. In addition, erosion is evident behind the sheet-pile retaining wall on the east side of this structure. Consideration should be given to relocating the fuel containment structure.

With regards to the small boil observed in the canal at the discharge end of the S-5 control structure, due to the water level in the canal as well as the vegetation, no indications of boils could be observed.

### Water Elevations

The existing water level in the impoundment on March 16, 1998 was about  $28.5 \pm$  feet. The high water mark on the elevation marker was about  $30.5 \pm$  feet.

### RESERVOIR #2

In general, the interior slopes, exterior slopes, top of banks, pump stations and control structures appeared to be in a satisfactory condition. We note that no water level indicators are present in this reservoir.

### WETLAND PRESERVES #1 AND #2

In general, the interior slopes, exterior slopes and top of banks along the wetland preserves are in an adequate condition. Shallow ruts caused by runoff erosion should be monitored and filled, if necessary, during routine mowing operations.

### CLOSURE

This report has been prepared in general accordance with generally accepted geotechnical engineering practices. The recommendations presented by Ardaman & Associates, Inc. are based solely on the information presented herein. The data reported is relevant to the dates of our field inspections, and should not be relied upon to represent site conditions on other dates.

It has been a pleasure to assist you on this phase of your project. Please contact us whenever we may be of service to you, and please call if you have any questions concerning this report.

Best regards,

ARDAMAN & ASSOCIATES, INC.

A handwritten signature in dark ink, appearing to read "John E. Donahue". The signature is fluid and cursive, with the first name "John" and last name "Donahue" clearly distinguishable.

MAR 23 1998

John E. Donahue, P.E.  
Branch Manager  
Fla. Reg. No. 43919

JED/dd

FOURTH ANNUAL  
ENVIRONMENTAL MONITORING REPORT  
GULFSTREAM GROVES 2  
NORTH WETLAND PRESERVE  
ST. LUCIE COUNTY  
SFWMD PERMIT #56-00745-S

Sections 1, 2, 3, 12, 13 (T34S/R38E)

January 12, 1998

Prepared by

James F. Milleson, C.E.P.

MILLESON ENVIRONMENTAL CONSULTING, INC.  
4630 121st Terrace North  
West Palm Beach, FL 33411-8920  
(561) 795-7575

FOURTH ANNUAL ENVIRONMENTAL MONITORING REPORT  
GULFSTREAM GROVES 2 - NORTH WETLAND PRESERVE  
CAPRON TRAIL COMMUNITY DEVELOPMENT DISTRICT

I. INTRODUCTION

A. PROJECT PERMIT DATA - Gulfstream Groves 2 - North Wetland Preserve

|                |                  |
|----------------|------------------|
| Application #: | 920602-3         |
| Permit #:      | 56-00745-S       |
| Issue Date:    | October 15, 1992 |

B. OBJECTIVE

The purpose of this program is to provide an environmental assessment of the plant communities and related natural resources within the 71.8 acre Wetland Preserve Area constructed as part of a 1,595 acre citrus grove project, located in the north portion of the Capron Trail Community Development District. In addition, this program will monitor changes in plant communities within the wetland preserve for a period of five years following completion of the facility and commencement of operation.

Special Condition #26 requires an environmental monitoring program be implemented for the preserve area, and shall include annual reports submitted for a period of five years.

Special Condition #27 references the mitigation plan, which requires that the permittee shall be responsible for the creation of 28.8 acres of marsh habitat and 18.7 acres of transitional habitat, and hydrologically restore 24.3 acres of existing wetland habitat within the Wetland Preserve Area.

Special Condition #28 requires a base-line sampling program be implemented and baseline monitoring report be submitted.

Special Condition #30 details the schedule to be followed relating to base-line monitoring and annual report submission. This schedule was subsequently modified by letter to South Florida Water Management District on January 28, 1993.

Special Condition #32 requires that a maintenance program be implemented for the created, preserved and restored wetland areas on a regular basis to ensure the integrity and viability of the conservation area. Maintenance shall be conducted in perpetuity to ensure that the conservation area is maintained free of exotic vegetation (Brazilian pepper, melaleuca and Australian pine) and that nuisance species constitute no more than 10% total cover.

Special Condition #34 specifies that the created wetland habitat shall provide a minimum 80% cover of desirable obligate and facultative wetland vegetation.

### C. CONSTRUCTION SCHEDULE

|                          |                |
|--------------------------|----------------|
| Begin Construction       | December 1992  |
| Complete Construction by | September 1994 |

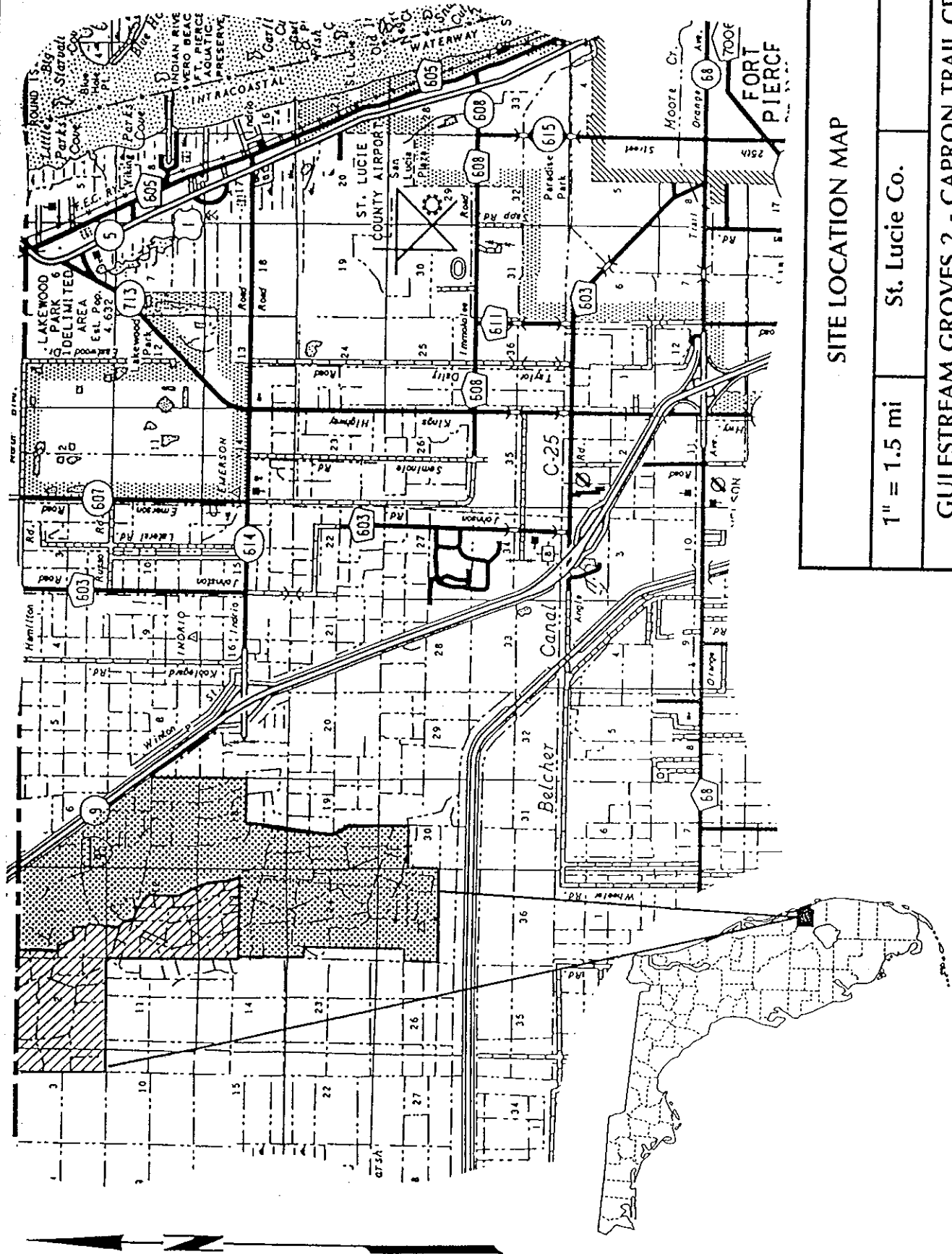
### D. MONITORING REPORT SCHEDULE

| Report        | Sampling Date | Submission Date | Due Date |
|---------------|---------------|-----------------|----------|
| Baseline      | 05-27-93      | 06-28-93        | 08-01-93 |
| First Annual  | 01-06-95      | 03-18-95        | 01-01-95 |
| Second Annual | 11-16-95      | 12-28-95        | 01-01-96 |
| Third Annual  | 12-03-96      | 12-24-96        | 01-01-97 |
| Fourth Annual | 12-17-97      | 01-12-97        | 01-01-98 |
| Fifth Annual  |               |                 | 01-01-99 |

## II. SITE LOCATION AND DESCRIPTION

Gulfstream Groves 2 is a 1595 acre citrus grove project located in sections 1, 2, 3, 12 and 13 (T34S/R38E) in northern St. Lucie County. The project is located north of Indrio Road extension and about one mile west of Interstate 95. The St. Lucie-Indian River County line forms the northern boundary of the project (Figure 1). The site is highly disturbed; a large portion of the area has been previously utilized for seasonal vegetable farming, which entailed the development of an extensive network of furrows, swales, berms and drainage ditches. Prior to citrus grove development, the site was most recently used as improved pasture for cattle grazing and sod production.

The Wetland Preserve Area was configured to include several of the largest and better quality wet prairie and marsh wetlands within the proposed project area. A total of six isolated wetlands, totalling 24.3 acres, were incorporated within the 71.8 acre Wetland Preserve. Implementation of a water level control plan within the Wetland Preserve by augmentation of surface water from the grove reservoir, when necessary, will create an additional 28.8 acres of wet prairie wetland habitat, with the remaining 18.7 acres considered by South Florida Water Management District as transitional habitat. Wetland and transitional habitat creation, in conjunction with hydroperiod enhancement in the existing wetlands, will provide mitigation for the grove impacts to 43.9 acres of poor to fair quality wetlands.



# SITE LOCATION MAP

1" = 1.5 mi St. Lucie Co.

GULFSTREAM GROVES 2 - CAPRON TRAIL CDD

MILLESON ENVIRONMENTAL

FIGURE 1

### III. SAMPLING AND MONITORING METHODS

Monitoring of the existing and created wetland and transitional habitats within the Wetland Preserve will consist of the following components:

- A. Vegetation Sampling: Initial sampling of plant communities within the proposed Wetland Preserve Area was conducted on May 27, 1993. Transect locations were selected to effectively document representative wetlands and adjacent transitional grassland habitats. The location of transects is essentially as depicted in the monitoring plan. The WEST transect measured 600 feet in length, and extended along a compass heading of 300 degrees. The EAST transect, 600 feet in length, was set at a compass heading of 80 degrees. For each transect, a metal pole was driven into the ground at the beginning, middle and end points, and covered with a ten foot length of PVC pipe.

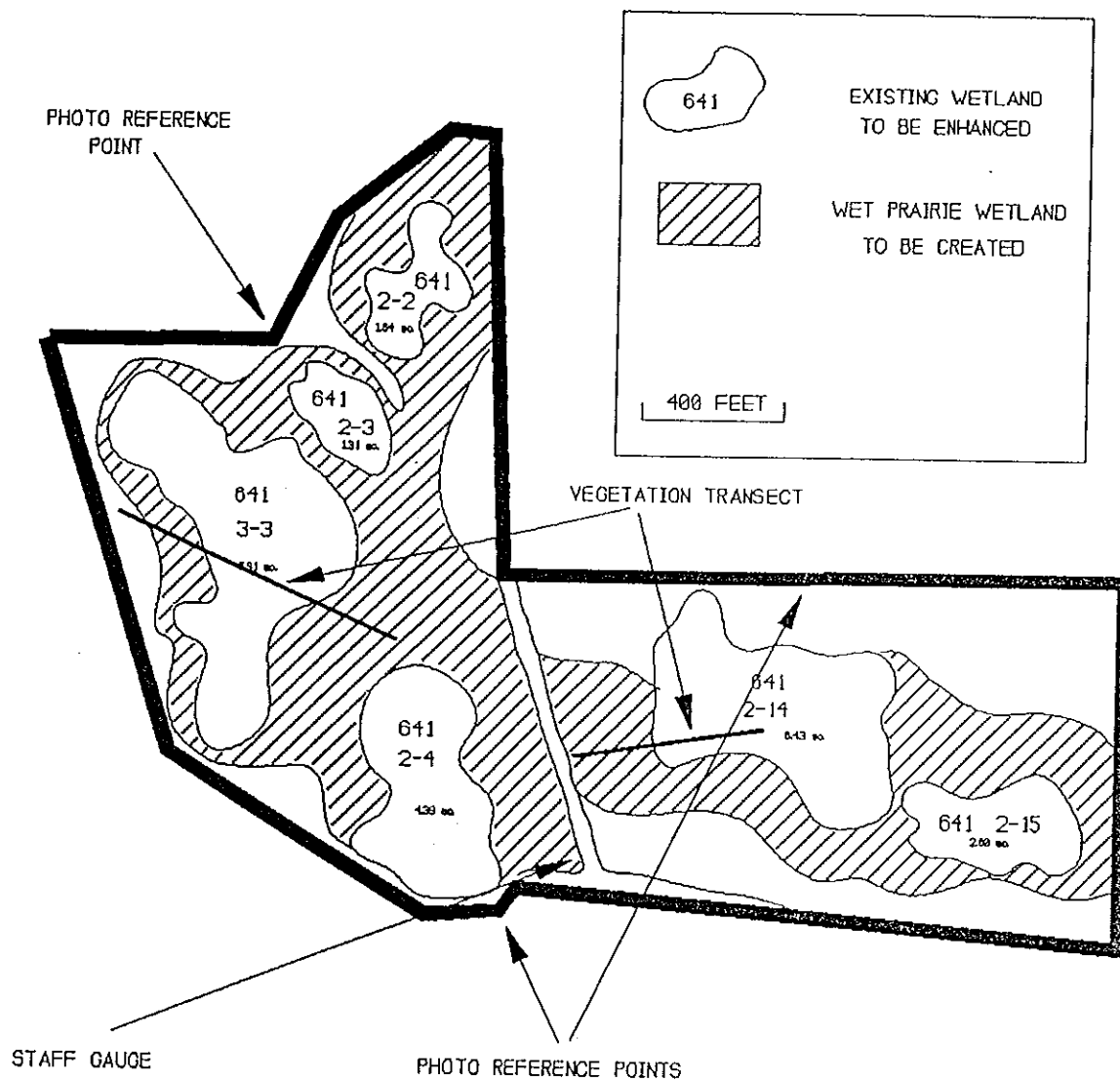
A fiberglass measuring tape was secured between the marker pipe, and sampling was conducted along the transect by placing a one meter square PVC frame at 25 foot intervals along the left side of the measuring tape. All species of plants falling within the frame were recorded, and percentage cover was estimated for each species. Water depth was also recorded to the nearest inch at each station with standing water. Each station was assigned to a habitat category based on the base-line species composition: wetland or transitional grassland.

Samples of unidentified plants were returned to the laboratory and identified to the extent possible, based on existing floristic characteristics using standard taxonomic references (Godfrey and Wooten, 1979; Wunderlin, 1982).

Vegetative characteristics for each habitat along the transects were determined by calculating the average percent cover of each species (the sum of percent cover estimates for each species from all stations divided by the total number of stations within that habitat type X 100), and the frequency occurrence for each species (number of sample quadrats in which a species is recorded divided by the total number of sample quadrats within that habitat).

- B. Photographic Documentation: A panoramic photographic record was made from three locations on the perimeter of the Wetland Preserve Area. For the baseline sampling, the location of the levee had to be estimated in the field. Photographs were taken from a standing position on the tail gate of a truck. Beginning with the first annual monitoring period, photographs will be taken from the top of the constructed levee. Permanent reference markers will be placed on the inside slope of the levee. A 180+ degree panoramic photo sweep was made by slightly overlapping photographs taken with a 50 mm lens, using 35 mm color print film. Locations of vegetation transects, photo reference points and other pertinent features are shown in Figure 2.





# SAMPLE LOCATIONS - MONITORING PLAN

St. Lucie Co.

WETLAND PRESERVE - GULFSTREAM GROVES 2

MILLESON ENVIRONMENTAL

FIGURE 2

- C. Aquatic macrofauna: Qualitative samples of small forage fishes and aquatic macro-invertebrates were obtained with a 10 mesh/inch hand dip net from inundated portions of the wetland to document the presence and relative abundance of food chain organisms. Samples collected in the field were stored in 10% formalin solution in plastic bags. Upon return to the laboratory, samples were washed free of detritus in a #30 standard sieve, identified, and enumerated.
- D. Wildlife Observations: On all trips to the project site, and especially during the vegetation survey and while travelling the Wetland Preserve Area perimeter levee, field notes were made concerning observations of birds, mammals and reptiles. Binoculars were used to facilitate identification of small or distant animals. Following the sample period, species observations were categorized as present (only one or two individuals sighted on one or two instances), common (species observed on several occasions), or abundant (species frequently seen in large accumulations).
- E. Hydrology: A staff gauge will be located in close proximity to the outfall control structure and referenced to feet NGVD. Water level readings will be taken on a weekly basis by grove management personnel. On the first day of each month, the actual water level in the Preserve will be compared with the target stage for that month. If the actual stage equals or exceeds the target stage, no action is necessary. If the actual stage is below the target stage, supplemental water will be added to the preserve from the water reservoir to reach the target stage. Data will be summarized as hydrographs in future reports and compared to the monthly target stages. Water level stage measurements will also allow for calculation of exact ground elevations along the transects by subtracting water depths at each station.

Rainfall will be measured on a daily basis at a rain gauge centrally located in the project site, and reported as monthly totals. Rainfall will be compared with long term (1950-87) average values obtained from Fort Pierce (United States Weather Bureau), located about 10 miles southeast of the project.

#### IV. RESULTS

The fourth annual monitoring of the North Wetland Preserve was conducted on December 17, 1997.

##### A. Vegetation

Wetland habitat along the WEST transect (Table 1) was characterized by a very high diversity of species (n=21) dominated by beakrush (Rhynchospora inundata), maidencane (Panicum hemitomon) and pickerelweed (Pontederia cordata). Tracy's beakrush (Rhynchospora tracyi), water hyssop (Bacopa caroliniana) and yellow-eyed grass (Xyris ambigua) were frequently encountered. In contrast, wetland habitats along the EAST transect (Table 2) contained a substantially fewer number of species (n=12), and were dominated by maidencane and pickerelweed. Primrose willow (Ludwigia peruviana) cover constituted 12.5%, the same amount as reported last year.

Transitional habitats along the WEST transect (Table 1) exhibited a very high species diversity (n=30), and were dominated by blue maidencane (Amphicarpum muhlenbergianum), broomsedge (Andropogon sp.) and coinwort (Centella asiatica). A diverse associated flora included species such as maidencane, lovegrass (Eragrostis sp.), dogfennel (Eupatorium capillifolium), beakrush (Rhynchospora microcarpa) and tall nutgrass (Scleria triglomerata). Bahia grass (Paspalum notatum) persisted at only one of the transitional stations. A total of 18 species were recorded from the EAST transect transition stations (Table 2), dominated by bahia grass, broomsedge and blue maidencane, with moderate amounts of maidencane, coinwort and goldenrod (Solidago tortifolia) present.

Complete sample results from the transects are provided in tables in the Appendix of this report. Panoramic photographs from three stations along the perimeter of the Wetland Preserve Area are also provided in the Appendix.

##### B. Aquatic macrofauna

Numerous sweeps with a dip net were taken from the marsh along the WEST transect and compiled into one composite sample. Water depth in the vicinity of the dip net sweeps was approximately 5 to 6 inches. The organisms recovered from these dip net samples consisted of:

|                  |                         |   |
|------------------|-------------------------|---|
| mosquitofish     | <u>Gambusia affinis</u> | 2 |
| water bug        | Hemiptera               | 1 |
| water beetle     | Coleoptera              | 5 |
| mayfly larvae    | Ephemeroptera           | 3 |
| dragonfly larvae | Odonata                 | 5 |

TABLE 1: COMPOSITION OF WETLAND AND TRANSITIONAL PLANT COMMUNITIES  
WEST TRANSECT  
GULFSTREAM GROVES 2 NORTH WETLAND PRESERVE - DECEMBER 17, 1997

| Species                            | Transitional |               | Wetland |               |
|------------------------------------|--------------|---------------|---------|---------------|
|                                    | Freq.        | Percent Cover | Freq.   | Percent Cover |
| <i>Amphicarpum muhlenbergianum</i> | 0.82         | 31.2          |         |               |
| <i>Andropogon</i> sp.              | 1.00         | 16.8          | 0.07    | 0.4           |
| <i>Axonopus</i> sp.                | 0.36         | 2.7           |         |               |
| <i>Bacopa caroliniana</i>          | 0.09         | 0.5           | 0.79    | 8.8           |
| <i>Centella asiatica</i>           | 1.00         | 10.5          | 0.14    | 0.3           |
| <i>Eleocharis cellulosa</i>        | 0.09         | 0.2           | 0.14    | 0.4           |
| <i>Eleocharis</i> sp.              | 0.18         | 0.9           |         |               |
| <i>Eragrostis</i> sp.              | 0.82         | 4.7           | 0.14    | 1.1           |
| <i>Eriocaulon decangulare</i>      |              |               | 0.64    | 6.2           |
| <i>Eupatorium capillifolium</i>    | 0.18         | 3.6           |         |               |
| <i>Euthamia minor</i>              | 0.27         | 1.1           |         |               |
| <i>Fuirena scirpoidea</i>          | 0.09         | 0.2           | 0.14    | 0.9           |
| <i>Gratiola ramosa</i>             |              |               | 0.14    | 2.5           |
| <i>Hydrocotyle umbellata</i>       | 0.09         | 0.5           |         |               |
| <i>Hypericum fasciculatum</i>      | 0.09         | 0.9           | 0.07    | 0.1           |
| <i>Ludwigia curtissi</i>           | 0.09         | 0.2           |         |               |
| <i>Ludwigia repens</i>             | 0.09         | 0.2           |         |               |
| <i>Panicum hemitomon</i>           | 0.27         | 8.0           | 0.71    | 14.6          |
| <i>Panicum repens</i>              | 0.09         | 0.5           | 0.14    | 3.6           |
| <i>Panicum rigidulum</i>           | 0.18         | 0.6           |         |               |
| <i>Panicum tenerum</i>             |              |               | 0.07    | 0.4           |
| <i>Paspalum notatum</i>            | 0.09         | 2.3           |         |               |
| <i>Pontederia cordata</i>          | 0.09         | 0.5           | 0.21    | 12.1          |
| <i>Proserpinaca palustris</i>      | 0.09         | 0.9           | 0.29    | 1.1           |
| <i>Rhexia cubensis</i>             | 0.36         | 1.3           |         |               |
| <i>Rhynchospora fascicularis</i>   | 0.27         | 1.6           |         |               |
| <i>Rhynchospora inundata</i>       | 0.09         | 0.5           | 0.71    | 27.0          |
| <i>Rhynchospora microcarpa</i>     | 0.36         | 2.9           | 0.07    | 1.8           |
| <i>Rhynchospora tracyi</i>         |              |               | 0.50    | 9.1           |
| <i>Sagittaria lancifolia</i>       |              |               | 0.14    | 1.1           |
| <i>Scleria reticularia</i>         | 0.36         | 1.6           | 0.07    | 0.4           |
| <i>Scleria triglomerata</i>        | 0.18         | 3.2           |         |               |
| <i>Solidago</i> sp.                | 0.09         | 0.5           | 0.14    | 0.5           |
| <i>Urena lobata</i>                | 0.09         | 0.9           |         |               |
| <i>Xyris ambigua</i>               | 0.18         | 0.9           | 0.64    | 7.3           |

TABLE 2: COMPOSITION OF WETLAND AND TRANSITIONAL PLANT COMMUNITIES  
EAST TRANSECT  
GULFSTREAM GROVES 2 NORTH WETLAND PRESERVE - DECEMBER 17, 1997

| Species                            | Transitional |               | Wetland |               |
|------------------------------------|--------------|---------------|---------|---------------|
|                                    | Freq.        | Percent Cover | Freq.   | Percent Cover |
| <i>Amphicarpum muhlenbergianum</i> | 0.27         | 16.2          |         |               |
| <i>Andropogon</i> sp.              | 0.91         | 22.3          | 0.07    | 0.7           |
| <i>Axonopus</i> sp.                | 0.18         | 0.9           |         |               |
| <i>Centella asiatica</i>           | 0.91         | 6.1           | 0.07    | 0.4           |
| <i>Crinum americanum</i>           |              |               | 0.14    | 0.7           |
| <i>Cyperus haspan</i>              | 0.09         | 0.5           | 0.07    | 0.1           |
| <i>Cyperus polystachyos</i>        | 0.18         | 1.4           |         |               |
| <i>Eleocharis</i> sp.              | 0.09         | 0.5           | 0.07    | 0.7           |
| <i>Hydrocotyle umbellata</i>       | 0.45         | 1.7           |         |               |
| <i>Hyptis alata</i>                | 0.09         | 0.9           |         |               |
| <i>Lachnanthes caroliniana</i>     | 0.09         | 0.9           |         |               |
| <i>Ludwigia peruviana</i>          |              |               | 0.36    | 12.5          |
| <i>Ludwigia repens</i>             |              |               | 0.07    | 0.1           |
| <i>Panicum hemitomon</i>           | 0.27         | 10.0          | 1.00    | 52.6          |
| <i>Panicum rigidulum</i>           | 0.45         | 2.6           |         |               |
| <i>Paspalum notatum</i>            | 0.55         | 24.8          |         |               |
| <i>Polygonum hydropiperoides</i>   |              |               | 0.07    | 0.4           |
| <i>Pontederia cordata</i>          | 0.36         | 3.2           | 1.00    | 30.7          |
| <i>Proserpinaca palustris</i>      | 0.18         | 0.5           |         |               |
| <i>Rhynchospora inundata</i>       | 0.18         | 1.4           |         |               |
| <i>Rhynchospora microcarpa</i>     | 0.18         | 1.1           | 0.07    | 0.7           |
| <i>Scleria reticularis</i>         |              |               | 0.07    | 0.4           |
| <i>Solidago tortifolia</i>         | 0.55         | 5.2           |         |               |

### C. Wildlife

Wildlife observed within the Preserve area on December 3, 1996 consisted of only a limited number of species. A total of only 5 species of birds were observed during the vegetation monitoring (Table 3), although a greater number of species would be anticipated if observations were made over a longer period and at different times of the day.

### D. Hydrology

Construction of the project was completed in September 1994; water level data has been collected on a regular basis for 1995 through 1996 (Figure 3). No water level data is available for 1997 with the exception of the sample date (December 17) when a staff gauge reading of 21.65 feet NGVD was recorded. The condition and composition of vegetation along the transects and within the remainder of the preserve suggests that wetland hydrology has been appropriate during the past year as well. Rainfall data has been collected on a regular basis for the duration of the monitoring program. Since completion of the project, rainfall data indicates that precipitation has been near long term average conditions for 1995-1996 and above average for 1997 (Table 4).

Ground elevation ranges along the transect have previously been calculated based on observed water depths at relatively high stages (when the majority of the preserve was inundated):

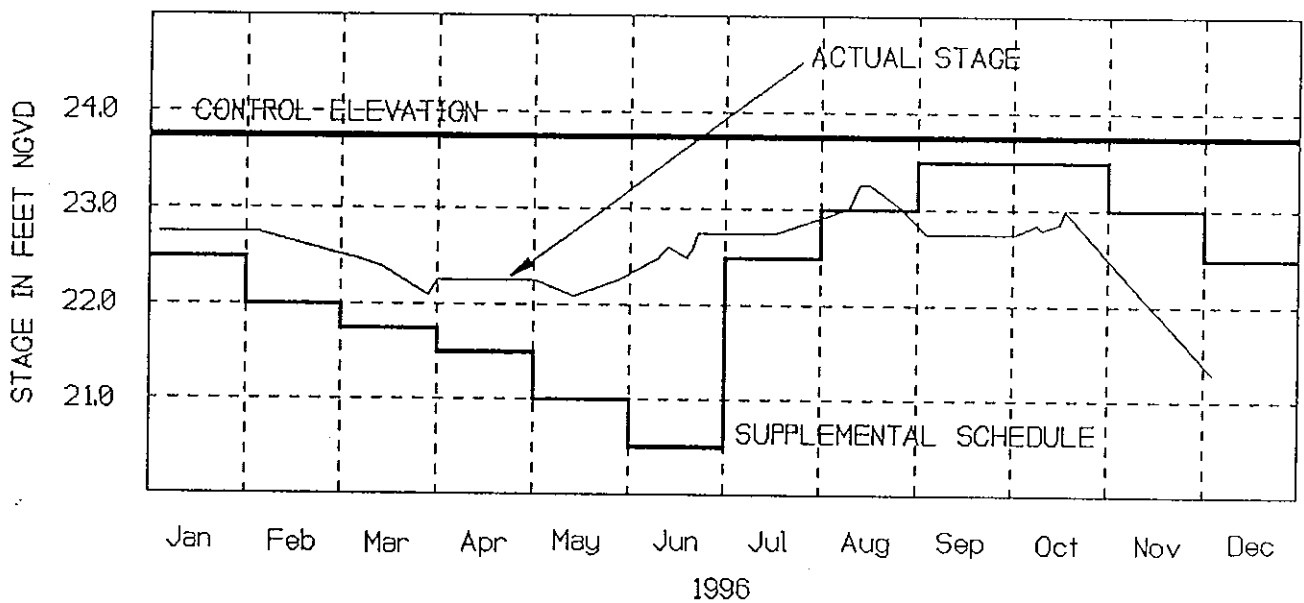
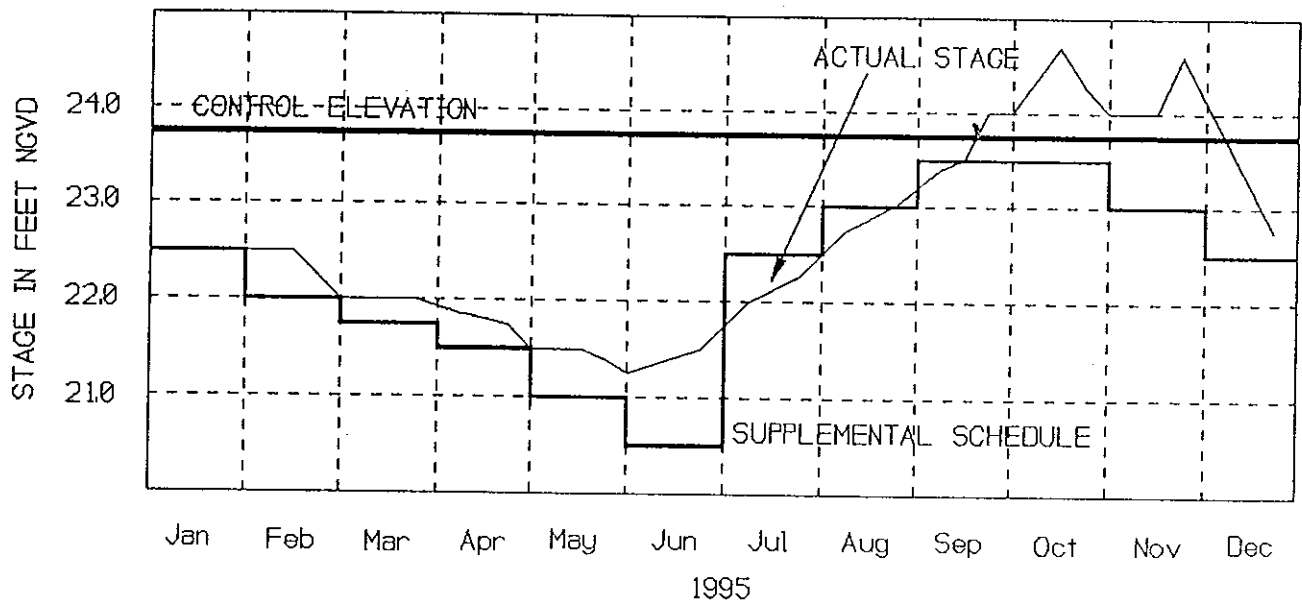
| Habitat                    | Ground elevations<br>(feet NGVD) |
|----------------------------|----------------------------------|
| WEST TRANSECT TRANSITIONAL | 23.83 - 23.16                    |
| EAST TRANSECT TRANSITIONAL | 23.91 - 23.08                    |
| WEST TRANSECT WETLAND      | 23.00 - 22.08                    |
| EAST TRANSECT WETLAND      | 23.00 - 22.66                    |

It should be noted that the staff gauge reading at the outflow structure does not necessarily correspond to water levels in the wetlands during low water periods. For instance, on December 17, 1997 the staff gauge reading levels was 21.65 feet NGVD, but water was ponded up to 10 inches deep in the west wetland, suggesting a stage of approximately 23.0 feet NGVD actually occurred. Conversely, no standing water was noted in the east wetland.

TABLE 3: WILDLIFE SPECIES OBSERVED IN WETLAND PRESERVE AREA  
GULFSTREAM GROVES 2 NORTH WETLAND PRESERVE - DECEMBER 3, 1996

| Common Name      | Scientific name     | Abundance* | Notes         |
|------------------|---------------------|------------|---------------|
| great blue heron | Ardea herodias      | P          |               |
| marsh hawk       | Circus cyaneus      | P          | shallow marsh |
| black vulture    | Coragyps atratus    | P          | overhead      |
| meadowlark       | Sturnella magna     | P          |               |
| ground dove      | Columbina passerina | P          |               |

\* P = Present  
C = Common  
A = Abundant



| WATER LEVEL HYDROGRAPH                 |             |  |
|--|-------------|--|
|  | 1995 - 1996 |  |
| WETLAND PRESERVE - GULFSTREAM GROVES 2 |             |  |
| MILLESON ENVIRONMENTAL                 | FIGURE 3    |  |



TABLE 4: MONTHLY RAINFALL TOTALS FOR GULFSTREAM GROVES  
NORTH WETLAND PRESERVE - SFWMD PERMIT #56-00745-S  
(Rainfall Totals in Inches)

| Month         | 1995    | 1996  | 1997  | 1998 | LONG<br>TERM<br>AVG.* |
|---------------|---------|-------|-------|------|-----------------------|
| January       | 2.40    | 1.85  | 3.25  |      | 2.02                  |
| February      | 2.50    | 0.78  | 2.00  |      | 2.91                  |
| March         | 2.05    | 8.22  | 3.00  |      | 3.32                  |
| April         | 1.65    | 3.33  | 9.60  |      | 2.75                  |
| May           | 1.30    | 4.32  | 3.25  |      | 4.59                  |
| June          | 4.85    | 9.50  | 7.61  |      | 6.15                  |
| July          | 4.30    | 3.85  | 6.80  |      | 5.65                  |
| August        | 6.95    | 4.40  | 12.75 |      | 6.00                  |
| September     | 7.78    | 5.20  | 5.20  |      | 7.76                  |
| October       | 10.86   | 8.40  | 1.85  |      | 6.93                  |
| November      | 0.70    | 0.30  | 2.60  |      | 2.76                  |
| December      |         | 1.75  | 4.20  |      | 2.21                  |
| Annual Totals | 45.34** | 51.91 | 62.11 |      | 53.05                 |

\* United States Weather Bureau, Ft. Pierce, Florida; 1950-87

\*\* partial year

## VI. DISCUSSION

This report provides the results of the fourth annual environmental monitoring of representative transitional grassland and wetland habitats incorporated into the 71.8 acre Wetland Preserve Area permitted to Capron Trail Community Development District as part of the surface water management system for the Gulfstream Groves 2 Citrus Project.

The permit requires that 28.8 acres of wet prairie wetland habitat and 18.7 acres of transitional wetland habitat be created, in addition to hydroperiod enhancement of the 24.3 acres of preserved wetlands, as compensation for project impacts to 43.9 acres of isolated wetlands located throughout the area to be farmed.

Construction of the perimeter levee surrounding the wetland preserve has been completed for approximately 39 months, and surface waters have consequently been impounded within the area for over three years. Water level data from the first two years indicates that stages have generally fluctuated in accordance with the target supplemental schedule. Sampling results show that in some cases there has been significant vegetational composition changes in both wetland and transitional habitats since the baseline period. Tables 5 - 8 compare results from the baseline and subsequent sample periods.

**Special Condition #26** requires the environmental monitoring program be implemented with annual reports submitted for a period of five years. **Status:** This report satisfies that condition for the fourth year.

**Special Condition #27** requires the creation of 28.8 acres of wetland habitat and the restoration of 24.3 acres of existing wetland habitat. **Status:** Results show seasonal inundation of the former transitional areas, with species composition continuing to trend towards wetland indicator species. Existing wetland habitats were also adequately inundated and supported wetland species.

**Special Condition #28** required a base-line sampling program and monitoring report. **Status:** This condition was satisfied in June 1993.

**Special Condition #32** requires a maintenance program be implemented to ensure the integrity and viability of the created, preserved and restored wetlands. Maintenance shall be conducted to insure the area is maintained free from exotic vegetation and that nuisance vegetation is controlled at levels less than 10% total cover. **Status:** Brazilian pepper shrubs need to be removed from two previously existing berms in the eastern portion of the Preserve as well as scattered infestations generally around the eastern perimeter of the Preserve. Additionally, it is still necessary to treat accumulations of primrose willow, primarily within the eastern half of the area. Primrose willow should be selectively treated with herbicide applications and/or hand removed. Figure 4 shows the approximate locations and extent of current Brazilian pepper and primrose willow infestations as observed on December 17, 1997.

TABLE 5: SPECIES COMPOSITION OF WETLAND HABITATS ALONG WEST TRANSECT  
GULFSTREAM GROVES 2 - 1993 TO PRESENT  
(percent cover; only values > 1.0% reported)

| SPECIES                 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|-------------------------|------|------|------|------|------|------|
| Amphicarpum muhlenberg. | -    | -    | -    | 1.2  | -    | -    |
| Andropogon glomeratus   | -    | 2.9  | 1.8  | -    | -    | -    |
| Bacopa caroliniana      | 6.4  | -    | -    | 13.7 | 8.8  | -    |
| Eleocharis cellulosa    | 1.1  | -    | -    | -    | -    | -    |
| Eleocharis sp.          | -    | -    | -    | 1.1  | -    | -    |
| Eragrostis sp.          | -    | -    | -    | -    | 1.1  | -    |
| Eriocaulon compressum   | -    | 2.1  | -    | 4.5  | 6.2  | -    |
| Fuirena scirpoidea      | 2.9  | 1.1  | 6.4  | 3.9  | -    | -    |
| Gratiola ramosa         | 2.5  | -    | -    | 2.5  | 2.5  | -    |
| Hypericum fasciculatum  | -    | -    | 1.1  | -    | -    | -    |
| Iva microcephala        | -    | -    | 1.1  | -    | -    | -    |
| Lachnanthes caroliniana | -    | 1.4  | -    | -    | -    | -    |
| Nymphoides aquatica     | -    | 1.4  | 1.4  | -    | -    | -    |
| Panicum hemitomon       | 10.7 | 6.6  | 5.7  | 10.7 | 14.6 | -    |
| Panicum repens          | 11.9 | -    | 5.4  | 6.4  | 3.6  | -    |
| Pontederia cordata      | 8.9  | 7.1  | 7.1  | 9.6  | 12.1 | -    |
| Proserpinaca sp.        | -    | -    | -    | 1.2  | 1.1  | -    |
| Rhynchospora inundata   | 5.0  | 5.4  | 6.1  | 25.3 | 27.0 | -    |
| Rhynchospora microcarpa | -    | -    | 1.1  | -    | 1.8  | -    |
| Rhynchospora tracyi     | -    | -    | 4.3  | 9.3  | 9.1  | -    |
| Sagittaria lancifolia   | 1.1  | -    | 1.4  | -    | 1.1  | -    |
| Scleria triglomerata    | -    | 1.8  | 52.5 | -    | -    | -    |
| Xyris ambigua           | -    | 2.2  | -    | 6.2  | 7.3  | -    |
| Unidentified grass      | -    | 3.6  | -    | -    | -    | -    |
| Open water/bare ground  | 46.6 | 62.4 | -    | -    | -    | -    |

- less than 1.0% or absent

TABLE 6: SPECIES COMPOSITION OF WETLAND HABITATS ALONG EAST TRANSECT  
GULFSTREAM GROVES 2 - 1993 TO PRESENT  
(percent cover; only values > 1.0% reported)

| SPECIES                | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|------------------------|------|------|------|------|------|------|
| Andropogon glomeratus  | -    | 5.4  | 5.4  | -    | -    |      |
| Centella asiatica      | 1.6  | -    | -    | -    | -    |      |
| Commelina diffusa      | -    | 1.2  | -    | -    | -    |      |
| Crinum americanum      | 1.4  | -    | -    | -    | -    |      |
| Cyperus haspan         | 1.4  | -    | -    | 1.1  | -    |      |
| Eleocharis minima      | 1.1  | -    | -    | -    | -    |      |
| Juncus effusus         | 2.9  | 4.3  | -    | -    | -    |      |
| Ludwigia peruviana     | 3.2  | 11.8 | 16.4 | 12.5 | 12.5 |      |
| Panicum hemitomon      | 43.6 | 32.9 | 40.4 | 46.1 | 52.6 |      |
| Polygonum spp.         | -    | 2.9  | 1.4  | 1.1  | -    |      |
| Pontederia cordata     | 33.5 | 36.6 | 28.6 | 30.4 | 30.7 |      |
| Rhynchospora filifolia | 1.4  | -    | -    | -    | -    |      |
| Sagittaria lancifolia  | 5.0  | 1.9  | 7.1  | 5.4  | -    |      |
| Open water/bare ground | 1.4  | 1.4  | -    | -    | -    |      |

- less than 1.0% or absent

TABLE 7: SPECIES COMPOSITION OF TRANSITIONAL HABITATS ALONG WEST TRANSECT  
GULFSTREAM GROVES 2 - 1993 TO PRESENT  
(percent cover; only values > 1.0% reported)

| SPECIES                          | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|----------------------------------|------|------|------|------|------|------|
| <i>Amphicarpum muhlen.</i>       | -    | 3.8  | 12.9 | 29.1 | 31.2 |      |
| <i>Andropogon glomeratus</i>     | 3.6  | 30.0 | 27.0 | 10.9 | 16.8 |      |
| <i>Axonopus furcatus</i>         | 21.4 | -    | -    | 2.3  | 2.7  |      |
| <i>Bacopa caroliniana</i>        | 1.4  | -    | -    | -    | -    |      |
| <i>Centella asiatica</i>         | 10.0 | 3.8  | 1.6  | 4.5  | 10.5 |      |
| <i>Cuphea carth.</i>             | 1.1  | -    | -    | -    | -    |      |
| <i>Cynodon dactylon</i>          | 7.3  | -    | -    | -    | -    |      |
| <i>Cyperus sp.</i>               | 1.1  | -    | -    | -    | -    |      |
| <i>Dicanthelium sp.</i>          | -    | 4.1  | -    | -    | -    |      |
| <i>Diodia virginica</i>          | 1.3  | -    | -    | -    | -    |      |
| <i>Eragrostis elliottii</i>      | -    | 2.3  | 12.7 | 14.1 | 4.7  |      |
| <i>Eupatorium capilli.</i>       | -    | 3.2  | 5.9  | 5.7  | 3.6  |      |
| <i>Euthamia minor</i>            | -    | 2.7  | 1.4  | -    | 1.1  |      |
| <i>Hypericum fasciculatum</i>    | -    | -    | 1.8  | -    | -    |      |
| <i>Iva microcephala</i>          | -    | 3.2  | -    | -    | -    |      |
| <i>Panicum dichotom.</i>         | 10.9 | -    | -    | -    | -    |      |
| <i>Panicum hemitomon</i>         | 1.8  | -    | -    | 2.9  | 8.0  |      |
| <i>Panicum repens</i>            | 3.6  | 8.6  | 2.7  | 3.2  | -    |      |
| <i>Panicum rigidulum</i>         | -    | -    | 2.3  | 2.9  | -    |      |
| <i>Paspalum notatum</i>          | -    | 6.4  | 12.0 | 4.1  | 2.3  |      |
| <i>Proserpinaca sp.</i>          | 1.5  | -    | -    | 1.4  | -    |      |
| <i>Rhexia cubensis</i>           | -    | -    | 2.4  | 1.4  | 1.3  |      |
| <i>Rhynchospora cephal.</i>      | -    | 3.8  | -    | -    | -    |      |
| <i>Rhynchospora fascicularis</i> | -    | -    | -    | -    | 1.6  |      |
| <i>Rhynchospora filifolia</i>    | 23.8 | -    | -    | -    | -    |      |
| <i>Rhynchospora inundata</i>     | -    | -    | -    | 1.4  | -    |      |
| <i>Rhynchospora microcarpa</i>   | -    | 1.1  | -    | -    | 2.9  |      |
| <i>Rhynchospora sp.</i>          | -    | -    | 3.4  | -    | -    |      |
| <i>Scleria reticularis</i>       | -    | -    | -    | 1.1  | 1.6  |      |
| <i>Scleria triglomerata</i>      | -    | -    | 7.8  | 8.9  | 3.2  |      |
| <i>Urena lobata</i>              | -    | -    | -    | 1.4  | -    |      |
| <i>Xyris sp.</i>                 | 1.0  | -    | -    | -    | -    |      |
| Unidentified species             | 2.3  | -    | -    | -    | -    |      |
| Open water/bare ground           | 1.6  | 22.0 | -    | -    |      |      |

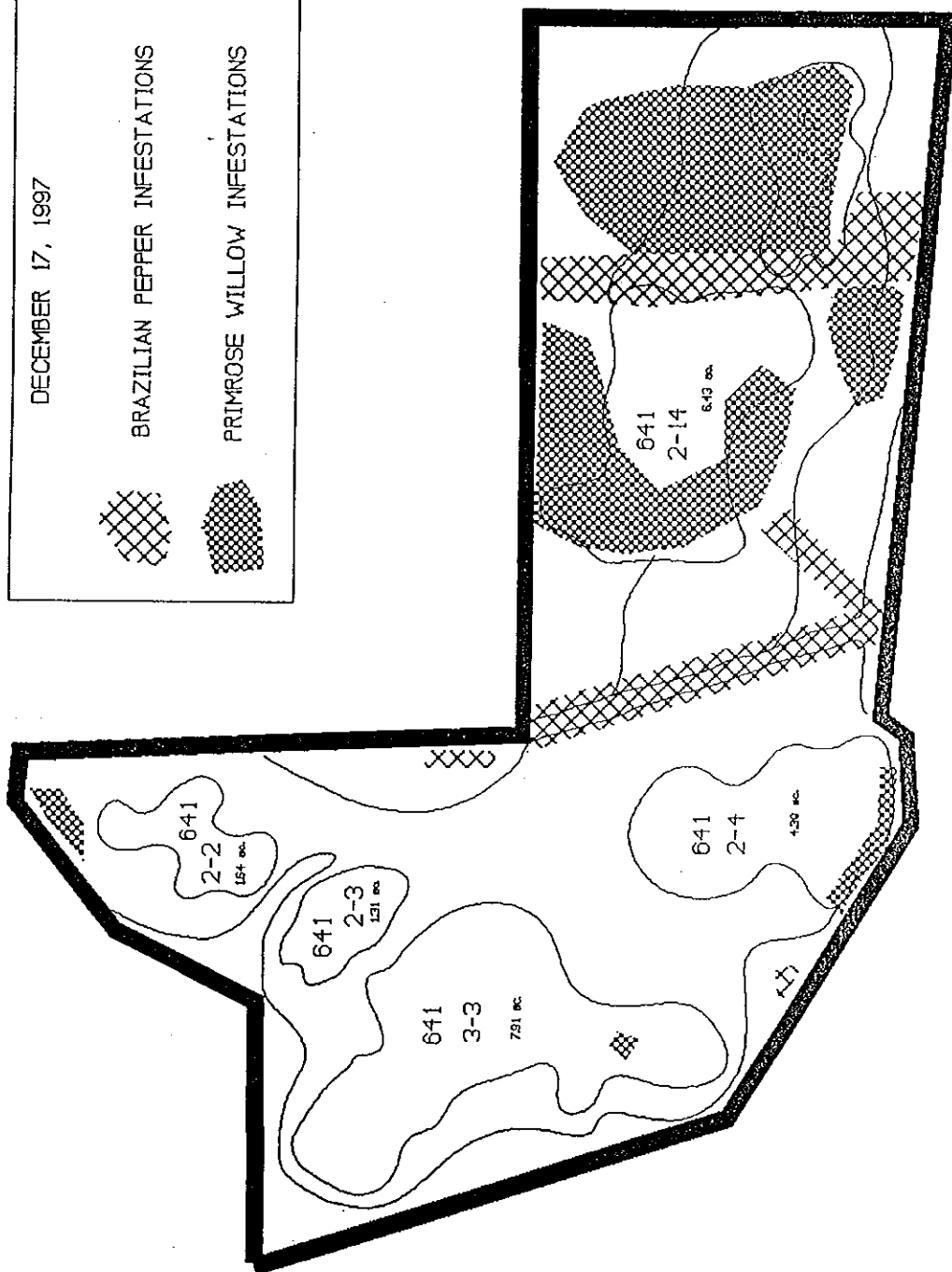
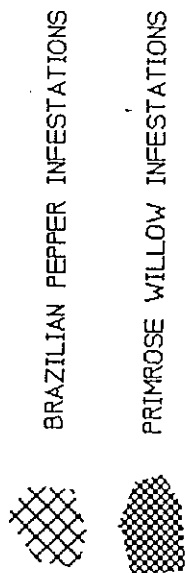
- less than 1.0% or absent

TABLE 8: SPECIES COMPOSITION OF TRANSITIONAL HABITATS ALONG EAST TRANSECT  
GULFSTREAM GROVES 2 - 1993 TO PRESENT  
(percent cover; only values > 1.0% reported)

| SPECIES                        | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 |
|--------------------------------|------|------|------|------|------|------|
| <i>Amphicarpum muhlenberg.</i> | -    | -    | -    | 6.2  | 16.2 |      |
| <i>Andropogon glomeratus</i>   | 5.0  | 40.3 | 41.9 | 18.4 | 22.3 |      |
| <i>Axonopus furcatus</i>       | 36.7 | -    | 4.1  | 1.4  | -    |      |
| <i>Centella asiatica</i>       | 10.7 | 7.6  | 1.1  | 7.0  | 6.1  |      |
| <i>Cuphea carth.</i>           | 2.3  | -    | -    | -    | -    |      |
| <i>Cyperus</i> sp.             | 1.3  | -    | -    | -    | 1.4  |      |
| <i>Eleocharis minima</i>       | 4.0  | -    | -    | -    | -    |      |
| <i>Hydrocotyle umbellata</i>   | -    | -    | -    | -    | 1.7  |      |
| <i>Ludwigia peruviana</i>      | -    | 1.4  | -    | -    | -    |      |
| <i>Myrica cerifera</i>         | -    | -    | -    | 4.6  | -    |      |
| <i>Panicum hemitomom</i>       | 1.4  | -    | 2.7  | 9.5  | 10.0 |      |
| <i>Panicum repens</i>          | 8.9  | 2.0  | 2.3  | 3.2  | -    |      |
| <i>Panicum rigidulum</i>       | -    | -    | 4.1  | 1.5  | 2.6  |      |
| <i>Paspalum notatum</i>        | 14.5 | 21.1 | 26.3 | 18.7 | 24.8 |      |
| <i>Pontederia cordata</i>      | -    | -    | 1.8  | 2.7  | 3.2  |      |
| <i>Proserpinaca palustris</i>  | -    | -    | -    | 4.6  | -    |      |
| <i>Rhynchospora filifolia</i>  | 5.9  | -    | -    | -    | -    |      |
| <i>Rhynchospora inundata</i>   | 1.8  | -    | 1.4  | 4.4  | 1.4  |      |
| <i>Rhynchospora microcarpa</i> | -    | -    | -    | 2.5  | 1.1  |      |
| <i>Sacciolepis striata</i>     | -    | 1.3  | 3.4  | 5.5  | -    |      |
| <i>Sagittaria lancifolia</i>   | -    | 1.8  | 2.3  | 1.8  | -    |      |
| <i>Solidago tortifolia</i>     | -    | 9.1  | 4.1  | 1.8  | 5.2  |      |
| Unidentified species           | 1.1  | -    | -    | -    | -    |      |
| Open water/bare ground         | -    | 11.4 | -    | -    | -    |      |

- less than 1.0% or absent

DECEMBER 17, 1997



EXOTIC AND NUISANCE VEGETATION - 1997

1" = 500 ft

St. Lucie Co.

WETLAND PRESERVE - GULFSTREAM GROVES 2

MILLESON ENVIRONMENTAL

FIGURE 4

**Special Condition #34** specifies that created wetland habitat shall provide a minimum of 80% cover of desirable obligate (OBL) and facultative wetland (FACW) vegetation. Based on the results of the fourth annual transect sampling, the following percentages were calculated for the transitional habitats (which best represent the "created wetland habitat") sampled by the transects:

| Indicator Status   |        | East Transect | West Transect |
|--------------------|--------|---------------|---------------|
| Obligate           | (OBL)  | 17.2          | 16.8          |
| Facultative Wet    | (FACW) | 51.2          | 67.8          |
| Facultative        | (FAC)  | 1.8           | 12.1          |
| Upland             | (UPL)  | 30.0          | 3.2           |
| Percent OBL + FACW |        | 68.4          | 84.6          |

The majority of the UPL vegetation documented along both transects consisted of bahia grass. Along the east transect, bahia grass cover has increased slightly since last year. The 80% target value has been met for the west transect, while the east transect value is close at 68+%. In addition, observations of other transitional areas not sampled by the transects shows a vegetation community dominated by species such as:

|                 |                                    |      |
|-----------------|------------------------------------|------|
| blue maidencane | <u>Amphicarpum muhlenbergianum</u> | FACW |
| broomsedge      | <u>Andropogon glomeratus (?)</u>   | FACW |
| beak rush       | <u>Rhynchospora microcarpa</u>     | OBL  |
| red root        | <u>Lachnanthes caroliniana</u>     | FAC  |
| musky mint      | <u>Hyptis alata</u>                | FACW |

The next scheduled environmental monitoring will be the fifth annual report, to be conducted during November-December 1998. In the interim, the following recommendations are made:

- \* re-institute the regular water level data collection program.
- \* initiate vegetation maintenance to remove Brazilian pepper and primrose willow from the preserve area, with special emphasis on the eastern half.



## APPENDIX

### Vegetation Transect Data Tables

#### Panoramic Photographs

[illegible]

## DECEMBER 17, 1997

community type<sup>a</sup>

[illegible]

VEGETATION TRANSECT RESULTS - PERCENT COVER IN ONE SQUARE METER QUADRATS  
 GULFSTREAM GROVES 2 NORTH WETLAND PRESERVE - EAST TRANSECT  
 DECEMBER 17, 1997

| Species                 | Station in feet |     |     |     |     |     |     |     |     |     |         |
|-------------------------|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------|
|                         | 325             | 350 | 375 | 400 | 425 | 450 | 475 | 500 | 525 | 550 | 575 600 |
| Amphicarpum muhlen.     |                 |     |     |     |     |     |     |     |     |     |         |
| Andropogon sp.          |                 |     |     |     |     |     |     |     |     |     |         |
| Axonopus furcatus       |                 |     |     |     |     |     |     |     |     |     |         |
| Centella asiatica       |                 |     |     |     |     |     |     |     |     |     |         |
| Crinum americanum       |                 |     |     |     |     |     |     |     |     | 5   | 5       |
| Cyperus haspan          |                 |     |     |     |     |     |     |     |     |     |         |
| Cyperus sp.             |                 |     |     |     |     |     |     |     |     |     |         |
| Eleocharis sp.          |                 |     |     |     |     |     |     |     |     |     |         |
| Hydrocotyle umbellata   |                 |     |     |     |     |     |     |     |     |     |         |
| Hyptis alata            |                 |     |     |     |     |     |     |     |     |     |         |
| Lachnanthes caroliniana |                 |     |     |     |     |     |     |     |     |     |         |
| Ludwigia peruviana      |                 |     |     |     |     |     | 50  | 35  | 20  | 40  | 30      |
| Ludwigia repens         |                 |     |     |     |     |     |     |     |     |     |         |
| Panicum hemitomon       | 90              | 80  | 60  | 60  | 70  | 50  | 10  | 45  | 30  | 25  | 70      |
| Panicum rigidulum       |                 |     |     |     |     |     |     |     |     |     |         |
| Paspalum notatum        |                 |     |     |     |     |     |     |     |     |     |         |
| Polygonum punctatum     |                 |     |     |     |     |     |     |     |     |     |         |
| Pontederia cordata      | 10              | 20  | 40  | 40  | 30  | 50  | 40  | 20  | 50  | 30  | 30      |
| Proserpinaca palustris  |                 |     |     |     |     |     |     |     |     |     |         |
| Rhynchospora inundata   |                 |     |     |     |     |     |     |     |     |     |         |
| Rhynchospora microcarpa |                 |     |     |     |     |     |     |     |     |     |         |
| Scleria reticularis     |                 |     |     |     |     |     |     |     |     |     |         |
| Solidago tortifolia     |                 |     |     |     |     |     |     |     |     |     |         |
| Water Depth (inches)    | -               | -   | -   | -   | -   | -   | -   | -   | -   | -   | -       |
| community type*         | W               | W   | W   | W   | W   | W   | W   | W   | W   | W   | W       |

\* T = transitional; W = wetland (based on baseline assessment)

**THIS PAGE CONTAINS PHOTOGRAPHS  
AND THEY ARE AVAILABLE FOR REVIEW  
AT THE OFFICE OF THE DISTRICT ENGINEER**

**Exhibit D**  
**Engineer's Estimate of Replacement Cost for Water Control Facilities of the  
 Capron Trail Community District, 1999**

| <b>Description</b>   |                     | <b>Estimated Replacement Cost<br/>(from the 1997 Report)</b> |
|--|---------------------|--|
| <b>I. Pump Stations</b>  |                     |  |
| A.   | PS-1                | \$300,000  |
| B.   | PS-2A               | 75,000   |
| C.   | PS-2B               | 75,000   |
| D.   | PS-1A               | 75,000   |
| E.   | PS-1B               | 75,000   |
| F.   | PSWR                | 75,000   |
|  |                     | <u>\$675,000</u>   |
| <b>II. Water Control Structures</b>  |                     |  |
| A.   | S-1 w/Gates         | \$500,000  |
| B.   | S-3 w/Gates         | 40,000   |
| C.   | S-4 w/Gate          | 16,000   |
| D.   | S-4A w/Gate         | 16,000   |
| E.   | S-5 w/Gates         | 115,000  |
| F.   | S-5A                | 17,000   |
| G.   | S-6                 | 11,000   |
| H.   | S-6A                | 5,000  |
| I.   | S-8A                | 17,000   |
| J.   | S-8B                | 17,000   |
| K.   | S-10 w/Gates        | 23,000   |
| L.   | S-15 w/Gates        | 115,000  |
| M.   | S-15A w/Gates       | 23,000   |
| N.   | S-16A               | 16,000   |
| O.   | S-17 w/Gates        | 23,000   |
| P.   | Header Canal Risers | 8,000  |
|  |                     | <u>\$962,000</u>   |
| <b>III. Culverts</b>   |                     |  |
| A.   | S-7                 | \$ 40,000  |
| B.   | S-8                 | 150,000  |
| C.   | S-10B               | 10,000   |
| D.   | S-10C               | 10,000   |
| E.   | S-11                | 70,000   |
| F.   | S-11B               | 70,000   |
|  |                     | <u>\$350,000</u>   |
| TOTAL (from the 1997 Annual Report)  |                     | \$1,987,000  |
| Increase Replacement Cost of Each Improvement by<br>Three Percent for a Total Increase of: |                     | 60,000   |

|  |                     |
|--|---------------------|
| <b>Estimated 1998-1999 Replacement Cost:</b> | <b>\$ 2,047,000</b> |
|--|---------------------|

**Exhibit D**