1990 ANNUAL REPORT FOR THE NICODEMUS SLOUGH MITIGATION/MONITORING PROJECT

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by

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INTRODUCTION

This document represents the 1990 Annual Report on the Nicodemus Slough restoration/mitigation monitoring project as required by Department of Environmental Regulation Permit Number 221324669. The report includes baseline data collected to monitor future vegetation changes in relation to an extended hydroperiod resulting from the proposed project.

The Nicodemus Slough restoration project encompasses approximately 2,200 acres (890 ha) in Glades County, immediately west of State Road 78 and south of Herbert Hoover Dike, in sections 5, 8, and 17, T41S, R32E. This property was purchased in 1988, through the Save Our Rivers land acquisition program, to accommodate flooding from the proposed higher Lake Okeechobee stages. The current project design and operation were developed to restore wetlands by maintaining a regulation schedule in the slough independent of lake water levels.

Several modifications have been made to the monitoring plan originally submitted as part of the permit application (Appendix 1). The sampling period was changed from July-October to late May to better assess effectiveness of the regulation schedule. Spring sampling will indicate whether the regulated hydroperiod is sufficient by documenting the survival of wetland species through the dry season. In addition, sample quadrats were spaced at five meter intervals, which was determined to be adequate, considering the homogeneous vegetation and gradual changes in elevation. Additional transects will be installed where distinct or abrupt declines in elevation are detected.

A second baseline sampling will be completed in May 1991, prior to operation of water control structure 5, followed by several surveys during the July-October period to record water levels along the transect.

METHODS

In April 1990, four 100 meter transects were established along a continuous transect running in an east-northeast direction (68 degrees), perpendicular to the natural slope of the land (Fig. 1). A permanent pipe was installed at the beginning and end of each transect, and reference photographs were taken at each of these locations. Vegetation was sampled on 16 May and 22 May 1990, utilizing an extended 100 meter tape measure and a $1m^2$ quadrat. Samples were taken at five meter intervals, two meters off the transect line center, resulting in 21 samples per transect. Species presence and densities (stems per quadrat) were recorded. In the case where no stems were apparent, a clump of grass leaves was recorded as one stem. Taxonomic identifications were made to genus or species, when possible. Plants that could not be positively identified were placed in general classes (e.g. unknown herbaceous, unknown grass). Percent occurrence was calculated by dividing the number of quadrats in which a species occurred by the total number of quadrat samples (21) along that transect.

Water levels will be recorded by a solid state digital recorder scheduled for installation by March 1, 1991. This recorder will be located in the east portion of the slough, just west of State Road 78 (Fig. 1). In addition, a recorder will also be installed at S-342.

Wading bird surveys of Lake Okeechobee marshes, including Nicodemus Slough, were initiated by the South Florida Water Management District in 1977. Since 1988, these Systematic Reconnaissance Flights (SRF) have been contracted by the District to the University of Florida. Surveys are conducted monthly between August and

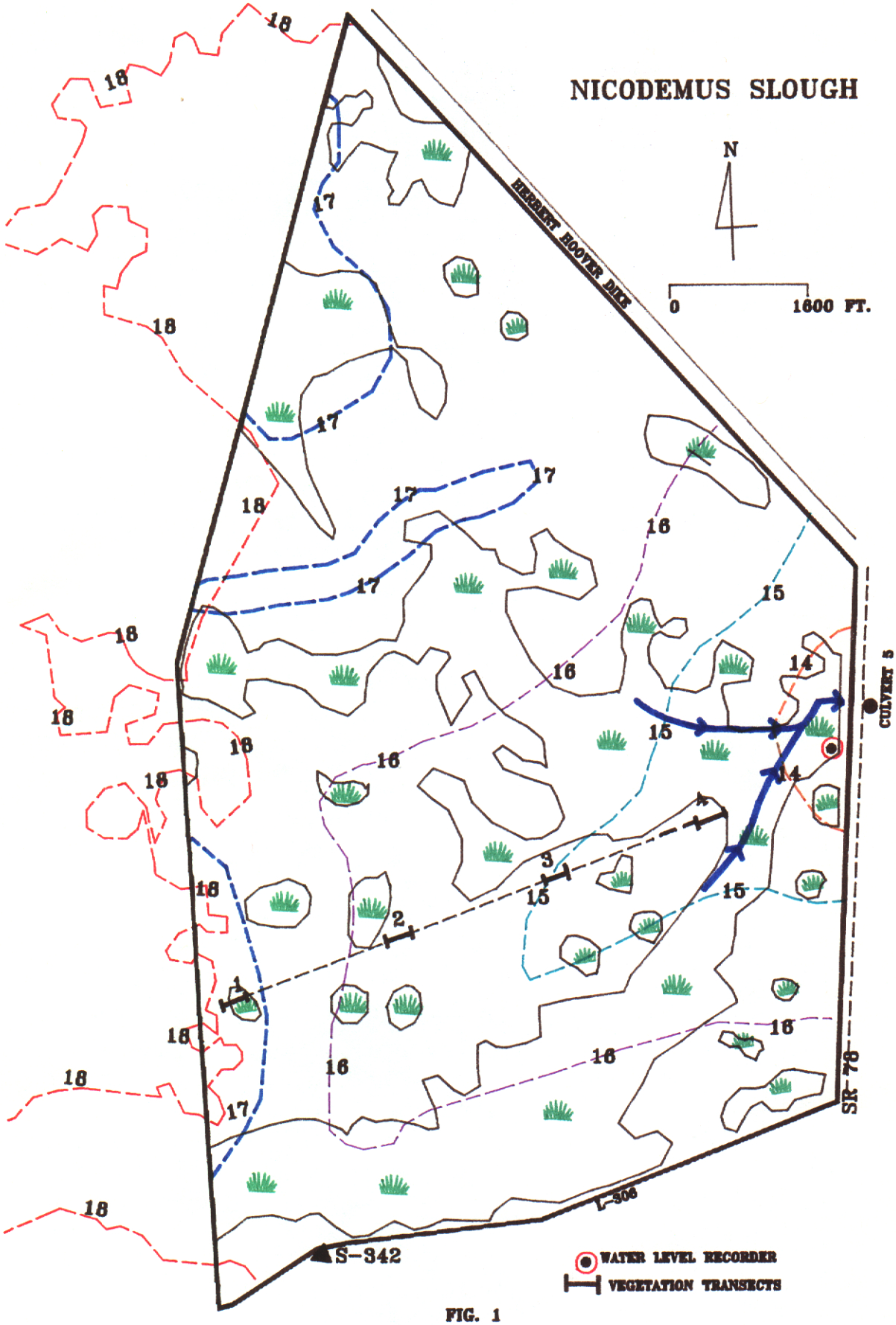
NICODEMUS SLOUGH
N
0
1600 FT.
HERBERT HOOVER DIKE
CULVERT 5
SR 78
L-306
S-342
WATER LEVEL RECORDER
VEGETATION TRANSECTS
18
17
16
15
14
1
2
3
4

FIG. 1

January, and approximately every two weeks during the nesting season (February-July).

RESULTS

Vegetation

Forty-five different plant species were recorded during the May sampling period, not including several plants that could not be identified to genus. In general, transect #1 had the most species (26), followed by transects 3, 2, and 4, with 24, 22, and 16 species, respectively. The effect of low lake levels from two successive drought years was evident by the dominance of terrestrial species.

Although transect 1 was located at the highest elevation, it extended into a depressional area which contained remnants of wetland vegetation (e.g. pickerelweed, maidencane). This abrupt change in elevation resulted in a mixture of terrestrial, aquatic and transitional species and is reflected in the greater number of species recorded on this transect. This depressional area had most recently been dominated by a dense stand of pigweed (Amaranthus australis), however the remaining stems were dead and not recorded in the sampling. Coinwort occurred in every quadrat, however chalky bluestem (Andropogon capillipes) and meadow beauty (Rhexia mariana) were dominant in terms of status and structure (Table 1.).

Transect 2 was characterized by an increase in carpet grass (Axonopus sp.) and a decrease in chalky bluestem (Table 2). Coinwort and meadow beauty continued to be abundant. Maidencane (Panicum hemitomon) occurred in one-third of the sample plots, however densities remained very low.

An increase in maidencane, smartweed (Polygonum punctatum) and arrowhead (Sagittaria lancifolia) were probably indicative of the lower elevations along transect 3. However, arrowhead occurred in very low densities, possibly reduced by the extended drought (Table 3). This transect was similar to transect 1, featuring a mixture of aquatic, terrestrial and transitional species.

Along transect 4, chalky bluestem and meadow beauty were replaced by broomsedge (Andropogon virginicus) and germander (Teucrium canadense), possibly indicating more hydric conditions closer to the main slough (Table 4). The abundance of frog-fruit (Phyla nodiflora) and dog fennel (Eupatorium sp.) suggests that these wetlands have experienced more recent overdrainage.

The presence of maidencane, pickerelweed and arrowhead, even in small numbers, provides evidence that a viable seed source for these wetland plants is still available. Thus, restoration of these wetlands may be contingent only upon re-establishing a normal hydroperiod.

Wading birds

Systematic Reconnaissance Flights conducted during 1989 and 1990, revealed that total birds utilizing the slough ranged from 0 (on 3-1-89) to 182 (on 7-6-89). Despite near normal rainfall, the maximum number of birds counted during 1990 surveys was only 143 on 26 July (Smith pers comm.). These numbers are considerably lower when compared with past wading bird use of the slough, and can be attributed directly to the low lake levels. White ibis (Eudocimus albus) comprised the majority of wading birds that foraged in those few sections of the slough that are seasonally inundated.

TABLE 1. NICODEMUS SLOUGH VEGETATION SAMPLING

TRANSECT #1
(N = 21 Quadrat Samples)

Species	% of Occurrence
Centella asiatica	100
Andropogon capillipes	62
Rhexia mariana	48
Panicum sp.	33
Panicum hemitomon	24
Phyla nodiflora	24
Echinochloa sp.	24
Ptilimnium capillaceum	19
Eupatorium sp.	19
Pontederia cordata	14
Setaria geniculata	14
Diodia virginiana	14
Rhynchospora microcarpa	14
Unknown herbaceous	14
Teucrium canadense	9
Oxalis corniculata	9
Amaranthus australis	9
Axonopus sp.	5*
Rhynchospora sp.	5*
Myrica cerifera	5*
Paspalum urvellei	5*
Pluchea rosea	5*
Diodia teres	5*
Bacopa monnieri	5*

* Species found only in one quadrat.

TABLE 2. NICODEMUS SLOUGH VEGETATION SAMPLING

TRANSECT #2
(N = 21 Quadrat Samples)

Species	% of Occurrence
Centella asiatica	86
Axonopus sp.	62
Rhexia mariana	57
Setaria geniculata	43
Panicum hemitomon	33
Unknown grass	33
Phyla nodiflora	24
Diodia virginiana	24
Panicum sp.	24
Andropogon capillipes	19
Cynodon dactylon	14
Unknown herbaceous	9
Paspalum notatum	9
Paspalum urvellei	9
Dichanthelium sp.	9
Ludwigia sp.	5*
Rhynchospora sp.	5*
Oxalis corniculata	5*
Buchnera americana	5*
Eupatorium capillifolium	5*

* Species found only in one quadrat.

TABLE 3. NICODEMUS SLOUGH VEGETATION SAMPLING

TRANSECT #3
(N = 21 Quadrat Samples)

Species	% of Occurrence
Centella asiatica	100
Panicum hermitomon	95
Andropogon capillipes	57
Rhexia mariana	52
Phyla nodiflora	48
Hyptis alata	43
Sagittaria lancifolia	33
Echinochloa sp.	29
Diodia virginiana	24
Polygonum punctatum	19
Rhynchospora microcarpa	19
Unknown herbaceous	19
Dichanthelium sp.	14
Ptilimnium capillaceum	5*
Eleocharis sp.	5*
Eupatorium sp.	5*
Bacopa caroliniana	5*
Pluchea sp.	5*
Myrica cerifera	5*
Ipomoea sp.	5*
Cassia nictitans	5*
Chloris glauca	5*
Cyperus sp.	5*

* Species found only in one quadrat.

TABLE 4. NICODEMUS SLOUGH VEGETATION SAMPLING

TRANSECT #4
(N = 21 Quadrat Samples)

Species	% of Occurrence
Phyla nodiflora	90
Andropogon virginicus	90
Teucrium canadense	52
Eupatorium sp.	43
Centella asiatica	43
Sagittaria lancifolia	19
Chloris glauca	14
Paspalum sp.	14
Unknown herbaceous	14
Unknown grass	9
Panicum sp.	9
Rhynchospora sp.	5*
Hydrocotyle sp.	5*
Mikania scandens	5*
Vicia sp.	5*
Polygonum sp.	5*
Cuscuta sp.	5*

* Species found only in one quadrat.

APPENDIX 1. Mitigation monitoring plan for Nicodemus Slough (to replace Figure 8 in permit application).

1) Install continuous digital water level recorder along the eastern boundary of the slough to provide hydroperiod data for the study area up to the 18 foot contour.

2) Establish a transect line, beginning at the western end of the area, running perpendicular to the normal slope of the land and terminating near culvert 5.

3) Install 100 meter subtransects in locations that best represent one foot contour elevations between 15 ft. and 18 ft. NGVD.

   a) Each transect segment will be marked with a permanent pipe at beginning and end.

   b) Vegetation will be documented along each transect by recording species presence and cover at 5m intervals within $1m^2$ quadrats located 2m off the transect line center.

   c) Documentation of vegetation will be conducted annually during May, beginning in 1990, and continuing through 1994.

   d) To accompany vegetation data, photographs will be taken annually at the beginning and end of each subtransect; in addition remote sensing may be employed to further document vegetation changes.

   e) Water depths along the transect will be measured by airboat during the period July-October to provide hydroperiod data at each sample site, and determine where additional subtransects may be needed.

4) Monitor wading bird use of the slough through 1993 by Systematic Reconnaissance Flights conducted by University of Florida.