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VEGETATION COMMUNITY STRUCTURE OF THE PROPOSED JANE GREEN DETENTION AREA

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ACKNOWLEDGEMENTS

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ABSTRACT

Vegetation potentially subject to a water regulation schedule in the Jane Green Detention Area was analyzed to establish baseline conditions. Dominant species associated with a particular community on an elevation gradient were: Fraxinus caroliniana, Taxodium distichum, Acer rubrum with hardwood swamps (23.0 - 32.5 ft. msl); Taxodium distichum and T. ascendens with cypress swamps (24.0 - 34.7 ft. msl); Sabal palmetto, Quercus hemisphaerica, Acer rubrum with hydric hammocks (24.3 -30.0 ft. msl); Sabal palmetto, Quercus virginiana, Quercus hemisphaerica with mesic hammocks (24.5 - 34.2 ft. msl); and Pinus elliottii with pine flatwoods (29.5 - 35.0 ft. msl).

INTRODUCTION

SUMMARY OF PHASE I, DEVELOPMENT OF ENVIRONMENTAL CONSTRAINTS FOR THE PROPOSED JANE GREEN DETENTION AREA

A water management schedule was determined for a proposed upland detention area in the Upper St. Johns River Basin by assessing potential impacts associated with inundation of vegetation communities along an elevation gradient. Vegetation damage was assumed to be the most critical potential impact of partial impoundment, affecting not only the water management function of the wetland forest, but also fish and wildlife habitat. Literature review revealed that flooding imposes stress on many vascular plants, ranging from leaf chlorosis to death, due to anoxic conditions which develop in the soil. Assessment of indigenous species' adaptations to inundation and independent factors such as depth, duration and timing of flood were incorporated in the development of the regulation schedule. The regulation schedule, devised to allow flood control while minimizing environmental damage, is presented below.

Jane Green Detention Area Regulation Schedule

Elevation	Duration (days) March 15 - Oct. 31	Nov. 1 - March 15
35 - 45.0 ft.	2	2
30 - 34.9 ft.	14	14
26 - 29.9 ft.	30	60
23 - 25.9 ft.	60	90
less than 23 ft.	90	120

Adverse impact was predicted for a few vegetation communities subject to the regulation schedule, particularly the xeric vegetation occurring at lower elevations; therefore, monitoring was recommended.

OBJECTIVES - PHASE II

The purpose of this investigation was to establish the baseline condition of vegetation communities prior to flood detention to enable monitoring of impacts during and after inundation. Previous work in the Jane Green Detention Area (Biagiotti-Griggs and Girardin, 1980) documented six major vegetation communities subject to the regulation schedule. They are:

Community Type	Elevation
Hardwood Swamp	23.0 - 32.5 ft. msl
Cypress Swamp	24.0 - 34.7 ft. msl
Hydric Hammock	24.3 - 30.0 ft. msl
Mesic Hammock	24.5 - 34.2 ft. msl
Dry Prairies	26.0 - 54.0 ft. msl
Pine Flatwoods	29.5 - 35.0 ft. msl

A study was designed to provide an analysis of the vegetation of each community type over its elevational range.

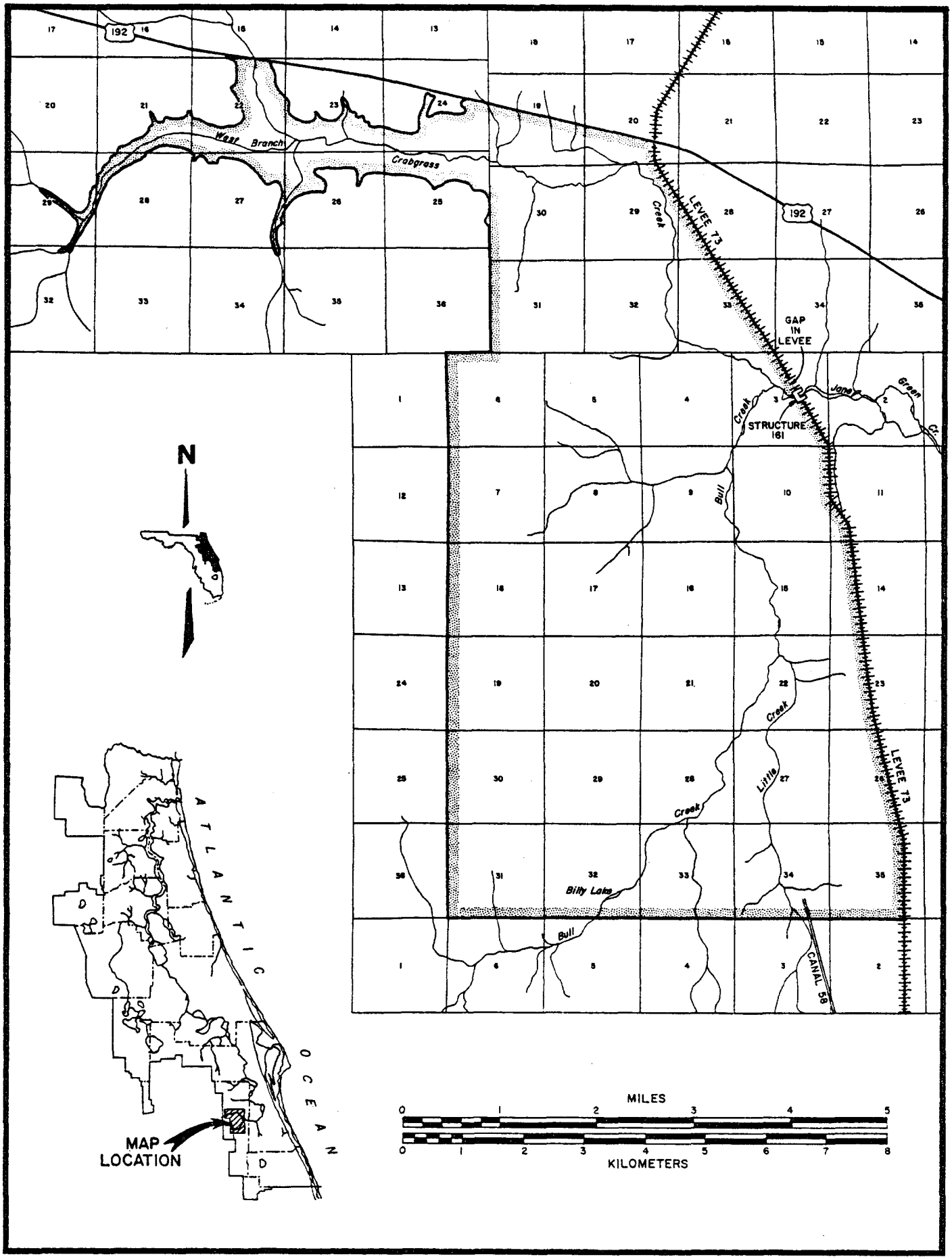


FIGURE 1 .-- Study Area: Proposed Jane Green Detention Area Showing SJRWMD Fee Simple Ownership.

METHODS

PHASE I

Four transects were established to describe the vegetation of the community type; two on Bull Creek and two on Crabgrass Creek (Figure 2). Transects on each creek were placed at varying distances upstream of Structure 161. Each transect began in an upland community, crossed the creek bottomlands and was terminated when a continuous upland community was reached on the other side of the creek. Elevation was determined at 100 feet (horizontal) intervals, and a species list of canopy, subcanopy and understory vegetation compiled. Community types were identified by their dominant vegetation and elevation, generally following Hartman (1978).

PHASE II

Using community delineation and regulatory constraints established in Phase I, a stratified random sampling scheme was designed. Four strata, each corresponding to an elevation range expressed in the regulation schedule (i.e., 23.0-25.9 feet, 26.0-29.9 feet, 30.0-34.9 feet, 35.0-45.0 feet) were utilized. For each vegetation community within a stratum, two randomly located quadrats were sampled (Figures 3-5). Although present in the detention area, there were no communities of elevations less than 23.0 feet within the transects.

Quadrat size was determined in preliminary sampling using species/area curves (Smith, 1966). The sizes were: hydric and mesic hammocks, 100 feet x 100 feet; hardwood swamp, 75 feet x 75 feet; cypress swamp and pine flatwoods, 55 feet x 55 feet; and dry prairies, 10 feet x 10 feet (shrubs), .5 feet x .5 feet (herbs). Thirty-six permanent quadrats were established,

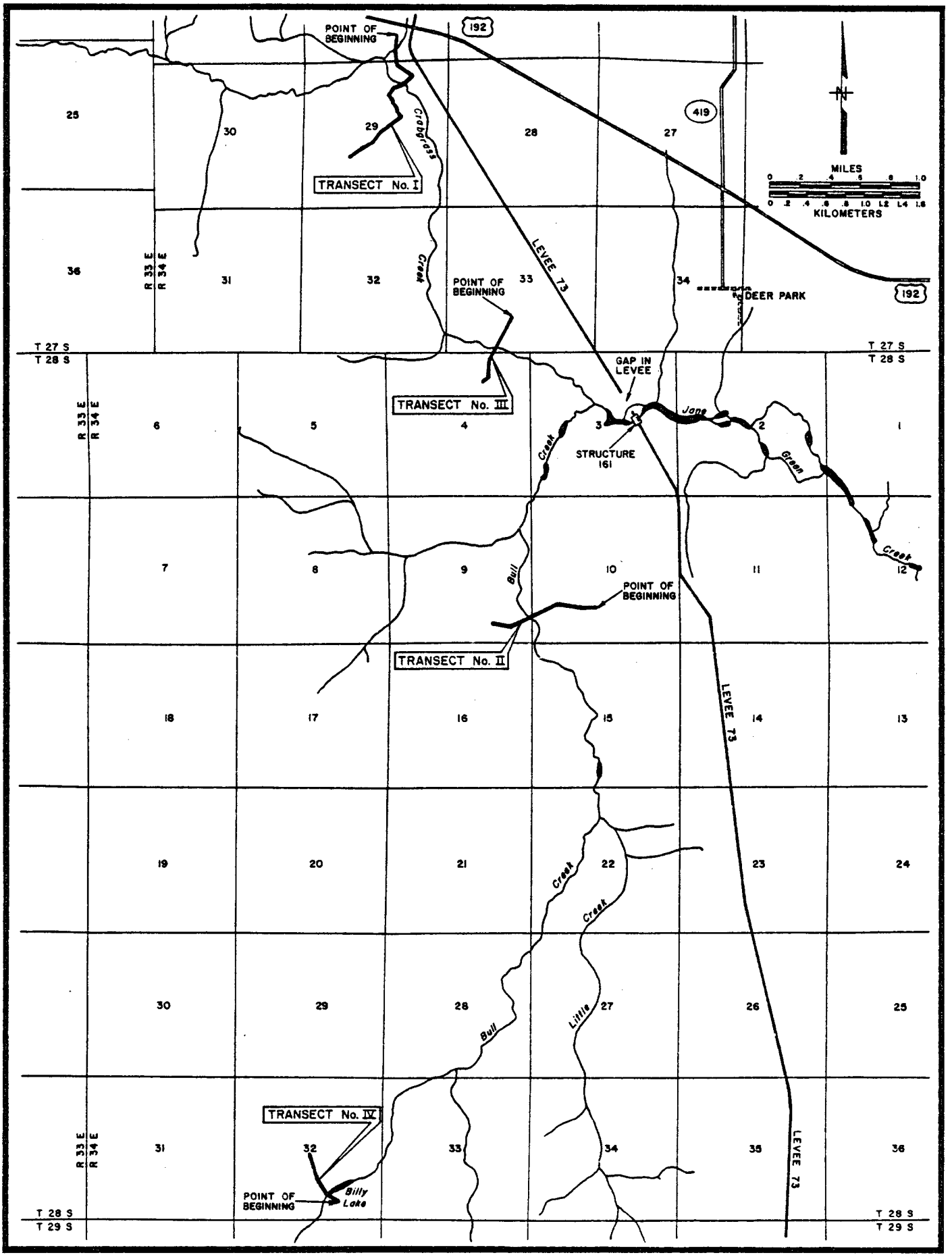


FIGURE 2. -- General Locator Map of Four Vegetation Transects in the Jane Green Detention Area

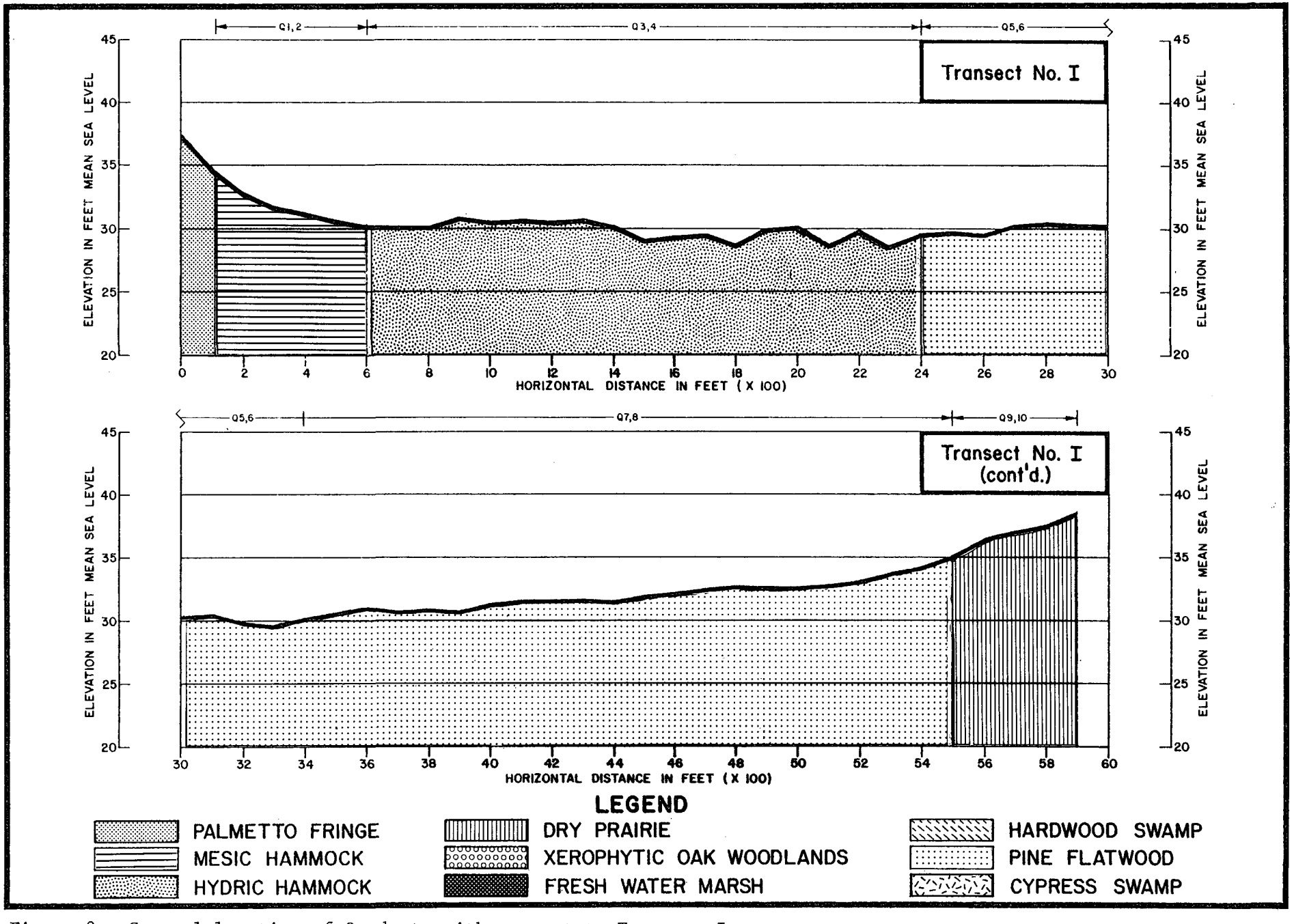


Figure 3. General location of Quadrats with respect to Transect I

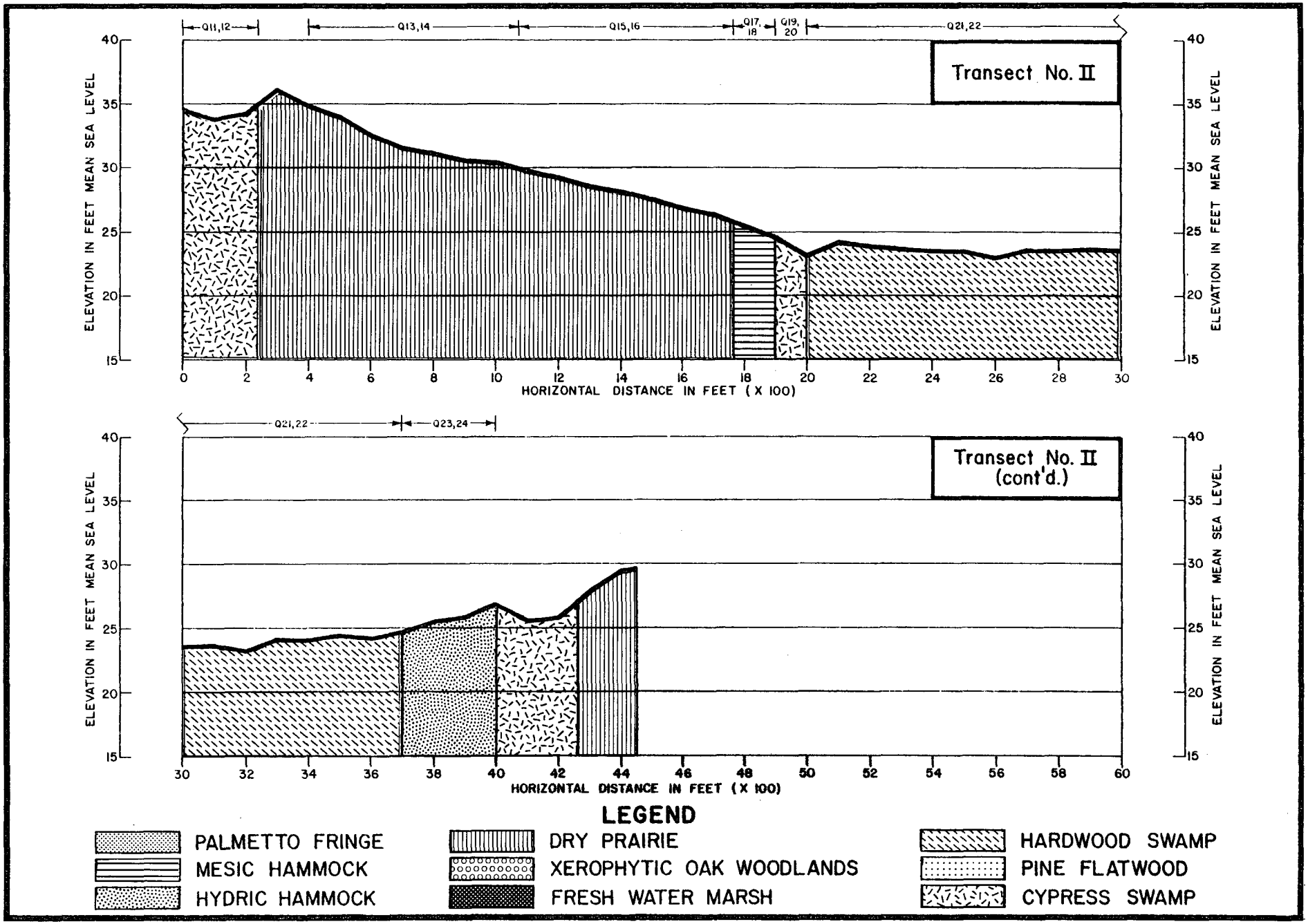


Figure 4. General location of Quadrats with respect to Transect II

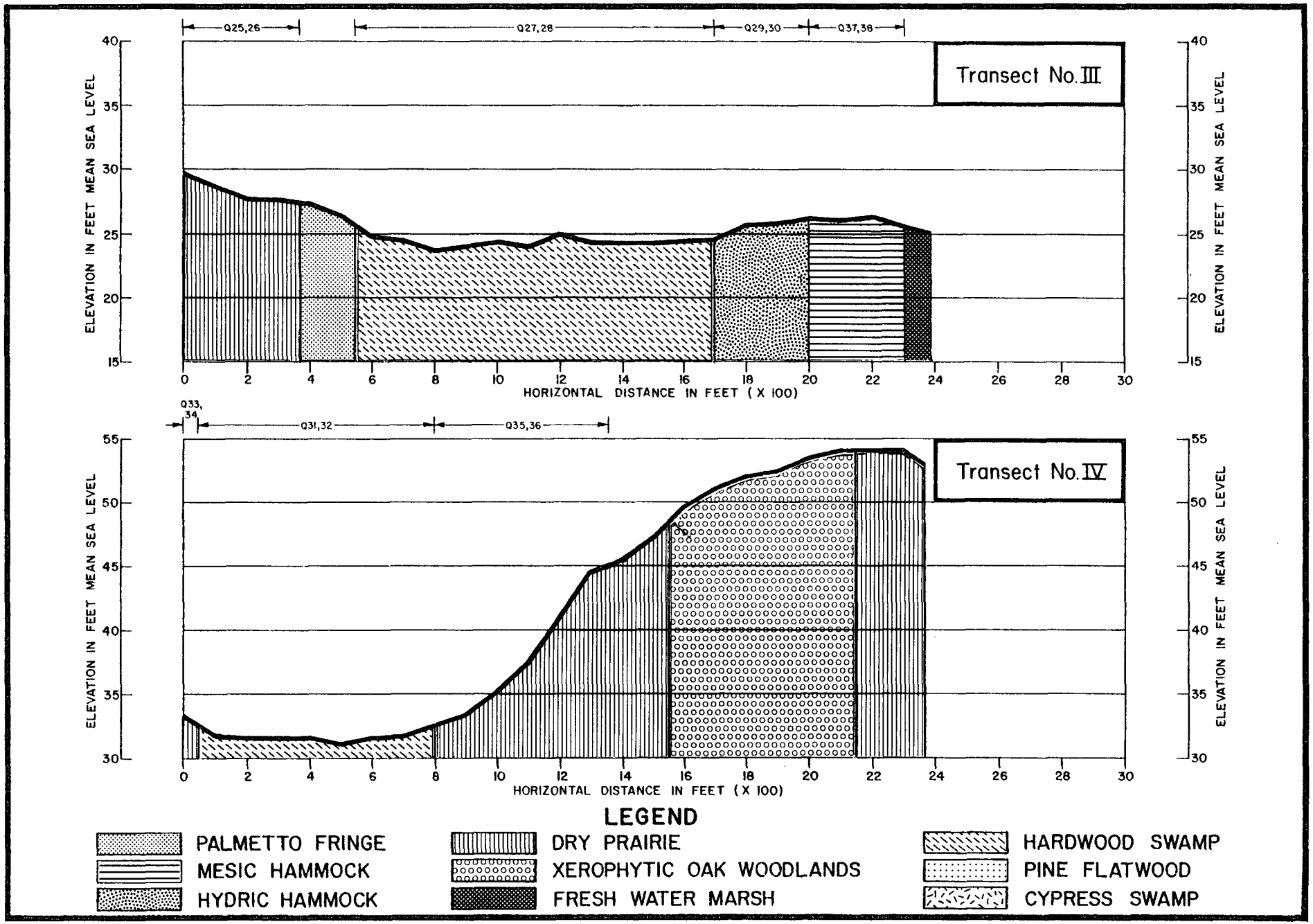


Figure 5. General location of Quadrats with respect to Transects III and IV

marked by stakes and tags and their distance from the transect line recorded (Appendices A and B.) Photographs of ground cover, trees and canopy were taken from each quadrat, to be permanently kept on file.

Within each quadrat, the number of species, number of individuals of each species and the diameter of each tree at approximately 53 inches height (dbh) were recorded. Measurements were recorded in ten feet wide strips so that individual trees could be located during monitoring efforts. Basal area, relative density, relative dominance, relative frequency and importance values (Curtis and McIntosh, 1951) were calculated for each quadrat (refer to Table 1). Importance value (IV), which is a summary of tree size, frequency within a quadrat, and presence in all quadrats of a particular community, was used to indicate dominant species within a community. Because a very high value for one of the components of IV can cause an inordinately high IV (e.g. a few individuals of very large size or numerous individuals of small size), the individual components of IV for dominant species were also analyzed.

A "control" area, similar in vegetation to the study area but not subject to impoundment, was searched for but was not found.

TABLE 1. --Explanation of Measures Used for Community Description

$$\text{Relative density} = \frac{\text{total individuals of species A}}{\text{total individuals of all species}} \times 100$$

$$\text{Relative dominance} = \frac{\text{basal area all species A}}{\text{total basal area all species}} \times 100$$

$$\text{Total frequency} = \frac{\text{Number of plots in which species occurred}}{\text{total number of plots}} \times 100$$

$$\text{Relative frequency} = \frac{\text{frequency value of species A}}{\text{frequency value of all species}} \times 100$$

Importance value = relative dominance + relative density + relative frequency

RESULTS AND DISCUSSION

VEGETATION COMMUNITIES

Hardwood Swamps. Located at the lower elevations (23.0 - 25.5 ft. msl) in the Jane Green Detention Area, hardwood swamps are the communities most subject to inundation. Hence, the most successful species in this community are those adapted to anaerobiosis. Due to the limited number of species with these specialized adaptations, the quadrats demonstrated a relatively constant composition of species. Fifty-six percent of all species recorded in this community were present in each quadrat. Fraxinus caroliniana (Carolina ash) had the highest importance value and was the most frequently occurring species, with 381 individuals (Table 2). It was followed in importance value by Taxodium distichum (bald cypress, 74 individuals) and Acer rubrum (red maple, 73 individuals). F. caroliniana had the highest total basal area: 73645.5 cm^2, compared to 55537.3 cm^2 for T. distichum. However, F. caroliniana had the second lowest mean diameter, 14.4 cm, of any species. Its importance can be attributed solely to the number of trees. Other species contributed to the 90 - 100% canopy coverage (Table 3).

Nearly all species present in the hardwood swamp exhibit excellent (T. distichum) to good (A. rubrum) flood tolerance, with the ability to form new secondary and/or adventitious roots and accelerate anaerobic respiration. The duration of flooding imposed by the regulation schedule should not pose a problem; however, the maximum depth (22 ft.) of potential inundation may be detrimental to all species.

Hydric Hammocks. Intermediate between hardwood swamp communities and mesic hammocks is a habitat which is moist, and occasionally has standing

Table 2. -- Tree Species With High Mean Importance Values

	Mean Importance Value	Total Number of Trees
Hardwood swamp		
Carolina ash	112.1	381
Bald cypress	58.3	74
Red maple	56.2	73
Hydric hammock		
Cabbage palm	84.3	141
Laurel oak	57.1	81
Red maple	51.6	70
American elm	35.4	62
Mesic hammock		
Cabbage palm	146.0	184
Live oak	89.7	11
Laurel oak	68.6	109
Sweetgum	55.0	38
Cypress swamp		
Pond cypress	264.8	42
Bald cypress	213.4	31
Pine flatwoods		
Slash pine	270.9	28

Table 3 . --Summary of Statistics for Hardwood Swamp Quadrats (all elevations)

SPECIES	NUMBER OF INDIVIDUALS	MEAN DIAMETER (CM)	MEAN BASAL AREA (CM^2)	MEAN RELATIVE DENSITY	MEAN RELATIVE DOMINANCE	MEAN RELATIVE FREQUENCY	MEAN IMPORTANCE VALUE
Fraxinus caroliniana Carolina ash	381	14.4	193.3	58.9	35.5	17.7	112.1
Taxodium distichum Bald cypress	74	26.9	750.5	15.0	25.6	17.7	58.3
Acer rubrum Red maple	73	26.3	683.0	13.9	24.6	17.7	56.2
Nyssa biflora Blackgum	20	25.7	717.1	3.9	6.8	17.7	28.5
Ulmus americana America elm	27	15.8	243.3	5.05	3.3	17.7	26.1
Quercus hemisphaerica Laurel oak	11	21.1	440.9	2.95	3.6	11.05	17.6
Gleditsia triacanthos Honey-locust	2	35.0	975.4	1.1	5.5	2.7	9.3
Sabal palmetto Cabbage palm	2	28.1	620.5	1.05	1.75	5.4	8.2
Ilex cassine Dahoon holly	6	8.4	62.8	2.3	.5	5.3	8.1

water derived primarily from rainfall or seepage (SJRWMD, 1977). Hydric hammocks have high species diversity and are edaphic climax ecosystems.

The hydric hammock quadrats, ranging from 24.3 - 29.9 ft. msl., contained many species that also appeared in mesic hammocks and hardwood swamps (Table 4). Trees were well developed and formed a fairly continuous canopy, with a subcanopy of younger trees. Ground cover was composed of grasses, herbs or leaf litter; shrubs were rare or absent.

Species with high importance values were Sabal palmetto (cabbage palm), Quercus hemisphaerica (laurel oak), and Acer rubrum. Other abundant species included Ulmus americana (American elm), Carpinus caroliniana (blue beech), Taxodium distichum and Nyssa biflora (blackgum). These species were present in most of the quadrats sampled. Since hydric and mesic hammocks had identical principal dominants, S. palmetto and Q. hemisphaerica, it was mainly the greater abundance of hydrophytes (T. distichum, Fraxinus caroliniana, N. biflora) and diminished ground cover that distinguished the hydric hammock community.

Mesic Hammocks. Mesic hammocks occurred within the elevations of 24.5 - 34.9 feet on the transects. Within the mesic communities sampled, there is a continuum of moist to semi-xeric vegetation which does not correspond to the numerical values of the elevation range, but rather to the hydraulic gradient of the stream as it approaches Structure 161 (S161). Quadrats 1 and 2 (30.0 - 34.9 ft. msl), located farthest from the structure, were moister than Quadrats 17 and 18 (24.5 - 25.9), which adjoin a cypress swamp in close proximity to S161. Common to all quadrats was the dominance of Sabal palmetto, and to a lesser extent, the importance of Quercus hemisphaerica for quadrats

TABLE 4 . --Summary of Statistics for Hydric Hammock Quadrats (all elevations)

SPECIES	NUMBER OF INDIVIDUALS	MEAN DIAMETER (CM)	MEAN BASAL AREA (CM^2)	MEAN RELATIVE DENSITY	MEAN RELATIVE DOMINANCE	MEAN RELATIVE FREQUENCY	MEAN IMPORTANCE VALUE
Sabal palmetto Cabbage palm	141	28.2	636.6	31.1	37.6	15.5	84.2
Quercus hemisphaerica Laurel oak	81	25.9	735.8	17.6	24.0	15.5	57.1
Acer rubrum Red maple	70	26.9	755.1	15.6	20.4	15.5	51.5
Ulmus americana American elm	62	16.0	255.8	13.5	6.4	15.5	35.4
Carpinus caroliniana Blue beech	27	13.3	157.4	16.2	5.2	5.0	26.4
Liquidambar styraciflua Sweetgum	14	24.1	546.3	9.95	8.2	4.95	23.1
Taxodium distichum Bald cypress	23	15.6	221.0	5.6	2.4	13.0	21.0
Fraxinus caroliniana Carolina ash	19	12.3	132.3	6.5	1.55	10.05	18.1
Carya aquatica Water hickory	5	40.5	1490.9	2.3	5.9	8.0	16.2
Nyssa biflora Blackgum	10	12.3	157.7	2.5	0.8	12.5	15.8
Ilex cassine Dahoon holly	4	10.9	94.2	2.4	.55	4.95	7.9
Cornus foemina Swamp dogwood	1	5.1	20.4	1.2	0.1	2.4	3.7

above 26.0 ft. msl. and Quercus virginiana (live oak) for quadrats below 26.0 ft. msl (Table 5).

Species composition of Crabgrass Creek quadrats 1 and 2 (30.0 - 34.9 ft. msl) seems to indicate optimal soil moisture and/or fertility for this community type (Appendix C). These quadrats contained the greatest number of species and the most well developed canopy and understory of all mesic quadrats. Many species of moderate moisture tolerance (as defined in Phase I) were present: Liquidambar styraciflua (sweetgum), which had a high importance value, Acer rubrum and Ulmus americana. Hydric species such as Nyssa biflora, Taxodium distichum and Carya aquatica (water hickory) were represented in small numbers.

Bull Creek quadrats 17 and 18 (24.5 - 25.9 ft. msl) were less moist than Crabgrass Creek quadrats 1 and 2. Q. virginiana and S. palmetto were the dominant species in quadrats 17 and 18 which contained 19 and 12 trees, respectively. Although Q. virginiana only occurred in these two quadrats with a total of 11 individuals, it ranked second in importance value for all mesic quadrats. This can be attributed to a combination of its large mean diameter and resultant high relative dominance and to its relative density in plots with few individuals.

Crabgrass Creek quadrats 37 and 38 (26.0 - 29.9 ft. msl) represented the drier end of the mesic continuum. Although a few individuals of Quercus minima (dwarf live oak) and Pinus elliottii (slash pine) were found in these quadrats, S. palmetto and Q. hemisphaerica were virtually the only species present. Before sampling, this community was burned and the understory, shrub layer and small trees eliminated.

TABLE 5 . -- Summary of Statistics for Mesic Hammock Quadrats (all elevations)

SPECIES	NUMBER OF INDIVIDUALS	MEAN DIAMETER (CM)	MEAN BASAL AREA (CM^2)	MEAN RELATIVE DENSITY	MEAN RELATIVE DOMINANCE	MEAN RELATIVE FREQUENCY	MEAN IMPORTANCE VALUE
Sabal palmetto Cabbage palm	184	27.8	631.5	47.4	60.3	38.3	146.0
Quercus virginiana Live oak	11	35.0	1083.7	32.05	43.05	14.6	89.7
Quercus hemisphaerica Laurel oak	110	14.5	207.2	26.7	12.0	29.9	68.6
Liquidambar styraciflua Sweetgum	38	21.8	500.0	22.9	22.8	9.3	55.0
Acer rubrum Red maple	11	32.0	931.6	6.8	12.6	9.3	28.7
Ulmus americana American elm	10	20.5	379.1	6.4	3.1	17.6	27.1
Quercus minima Dwarf live oak	9	13.0	162.6	4.65	1.6	14.35	20.6
Pinus elliottii Slash pine	3	22.8	454.8	3.6	1.9	12.9	18.4
Quercus geminata Sand live oak	1	12.7	126.6	8.3	1.4	8.3	18.0
Nyssa biflora Blackgum	5	15.8	204.2	3.0	1.2	9.3	13.5
Quercus nigra Water oak	1	10.8	91.6	5.3	0.6	6.2	12.1
Taxodium distichum Bald cypress	1	9.5	70.8	1.3	.2	4.7	6.2
Morus rubra Red mulberry	1	16.05	201.0	1.2	0.5	4.5	6.2
Carya aquatica Water hickory	1	15.0	176.6	1.2	0.4	4.5	6.1

Under the regulation schedule, mesic communities in the lower elevations (quadrats 17, 18, 37, 38) would be subject to lengthy flooding regimes. Presently, these communities do not retain excess water; species unaccustomed to water stress, particularly Q. minima and Q. virginiana, may be adversely impacted.

Cypress Swamps. Swamps composed predominately of cypress in the Jane Green Detention area may occur as isolated cypress domes or as strands connecting wetlands. Although limited in occurrence along the transects, strand and dome cypress swamps were sampled between 24.0 - 34.9 ft. msl.

The cypress dome was composed almost entirely of Taxodium ascendens (pond cypress), with only one individual of another species occurring (Nyssa biflora). Taxodium distichum dominated the strand but a few individuals of Nyssa biflora and Fraxinus caroliniana were also present (Table 6). Approximately 15 dead T. distichum were observed in the area near the strand quadrats, with no indication of cause. The rest of the community, although openly spaced, appeared healthy.

Both the dominant and secondary species of these communities have well-developed adaptations to inundation and should not be adversely impacted by the regulation schedule.

Pine Flatwoods. Pine flatwoods were sampled within the 30.0 - 34.9 foot contour interval. The canopy was completely composed of Pinus elliottii (slash pine) except for one individual of Sabal palmetto (Table 7). Serenoa repens (saw palmetto) was the principal component of the shrub layer.

TABLE 6. --Summary of Statistics for Cypress Swamp Quadrats (all elevations)

SPECIES	NUMBER OF INDIVIDUALS	MEAN DIAMETER (CM)	MEAN BASAL AREA (CM^2)	MEAN RELATIVE DENSITY	MEAN RELATIVE DOMINANCE	MEAN RELATIVE FREQUENCY	MEAN IMPORTANCE VALUE
Taxodium ascendens Pond cypress	42	22.9	455.5	98.3	96.5	70.0	264.8
Taxodium distichum Bald cypress	31	23.8	490.4	86.9	89.9	36.7	213.5
Nyssa biflora Blackgum	3	29.4	691.9	5.1	7.1	56.7	68.9
Fraxinus caroliniana Carolina ash	2	16.0	234.15	14.3	5.8	16.7	36.8

TABLE 7. --Summary of Statistics for Pine Flatwoods Quadrats

SPECIES	NUMBER OF INDIVIDUALS	MEAN DIAMETER (CM)	MEAN BASAL AREA (CM^2)	MEAN RELATIVE DENSITY	MEAN RELATIVE DOMINANCE	MEAN RELATIVE FREQUENCY	MEAN IMPORTANCE VALUE
Pinus elliottii Slash pine	28	21.1	369.3	96.65	90.9	83.35	270.9
Sabal palmetto Cabbage palm	1	39.4	1218.6	6.7	18.2	33.3	58.2

P. elliottii occurs infrequently in mixed hardwood stands. In all the quadrats sampled, only four individuals were recorded outside the pine flatwoods (mesic hammock quadrats 17, 38 and dry prairie quadrat 25). The pine flatwoods community is maintained and stabilized by fire, which eliminates the more mesic invaders (Monk 1968, Wade et al. 1980, Laessle 1958). Apparently, due to frequent fire in the quadrats sampled, the subcanopy was absent and the shrub layer sparse and low in most places.

Pine flatwoods are characterized by a hardpan underlying the soil surface, which may cause the water table to rise close to or above the surface during periods of high rainfall (SJRWMD, 1977). Thus, pines may be able to endure limited inundation as long as the depth of water is not extreme.

Dry Prairies. An upland community, dry prairies are composed primarily of shrubs and herbs, with occasional scattered pines, cypress domes or bayheads.

Serenoa repens and Ilex glabra (gallberry) were the most frequently occurring shrubs in the sample area (Table 8). Lyonia ferruginea (staggerbush), Lyonia lucida, (fetterbush), Myrica cerifera (wax myrtle), Quercus minima (dwarf live oak) seedlings and Vaccinium myrsinites (blueberry) comprised the remainder of recorded shrubs.

Aristida sp. was the dominant herb in all quadrats; others are listed in Table 9. Quadrats 33 and 34 contain a diversity of species, including many typically found in moist areas. The area sampled by these quadrats appears to be a transition zone between the hardwood swamp and the drier prairies. With the exception of these two quadrats, the vegetation of this community was xerophytic. This indicates that these areas are rarely inundated. Prolonged inundation would be detrimental to these communities.

Table 8. SUMMARY OF SHRUB PRESENCE IN DRY PRAIRIE QUADRATS

	NUMBER OF SHRUBS													
	Elevation 26.0-29.9					Elevation 30-34.9					Elevation 35-45				
SPECIES	Q15	Q16	Q25	Q26	Total Frequency (%)	Q13	Q14	Q33	Q34	Total Frequency (%)	Q9*	Q10*	Q35	Q36	Total Frequency (%)
Ilex glabra	30	1		3	75					0				8	50
Lyonia ferruginea	2	1			50					0				4	50
Lyonia lucida					0	5				25					
Myrica cerifera					0			3 clumps 32 stems		25			7	1 clump 6 stems	100
Serenoa repens	15	20	18	12	100	22	10			50			11	11	100
Vaccinum myrsinites	2				25					0					0

* Communities temporarily eliminated, due to fire.

Table 9. -- Summary of Herb Presence in Dry Prairie Quadrats

Elevation 26.0 - 29.9 feet

Quadrats 15, 16

1. Aristida stricta
2. Andropogon sp.
3. Panicum citiatum

Quadrats 25 and 26 were covered with a heavy litter layer (4 cm.) of pine straw. There were few living grasses.

Elevation 30.0 - 34.9 feet

Quadrats 13, 14

1. Aristida stricta
2. Paspalum setaceum var. longepeduculatum
3. Quercus minima seedlings
4. Panicum citiatum
5. Panicum sp.

Quadrats 33, 34

1. Aristida virgata
2. Hypericum cistifolium
3. Panicum sp.
4. Andropogon sp.
5. Paspalum laeve
6. Fuirena scirpoidea
7. Rhexia virginiana
8. Acer rubrum seedlings
9. Panicum hemitomon
10. Panicum chamelonche
11. Rhynchosphora fascicularis
12. Setaria geniculata
13. Solidago chapmanii

Elevation 35.0 - 45.0 feet

Quadrats 9, 10

These plots were burned before data could be collected.

Quadrats 35, 36

Due to the heavy shrub layer, herbs were mostly absent.

Table 10. --Summary of Size Statistics for Important Species

QUERCUS HEMISPHAERICA

	Mesic Hammock	Hydric Hammock	*Hardwood Swamp
Diameters (cm)			
Mean	14.5	25.9	21.1
Median	12.1	20.9	17.4
Mode	9.0-9.9	14.0-14.9	
Range	5.3-54.7	6.5-77.4	9.5-43.5
# individuals	110	81	11

SABAL PALMETTO

	Mesic Hammock	Hydric Hammock	*Hardwood Swamp
Diameters (cm)			
Mean	27.8	28.2	28.1
Median	27.4	27.9	28.1
Mode	27.0-27.9	25.0-25.9	
Range	16.9-48.5	17.7-42.0	27.2-29.0
# individuals	184	141	2

ACER RUBRUM

	Mesic Hammock	Hydric Hammock	*Hardwood Swamp
Diameters (cm)			
Mean	32.0	26.9	26.3
Median	28.6	21.7	26.3
Mode	28.0-28.9	15.0-15.9	31.0-31.9
Range	10.6-49.5	7.4-72.6	6.3-71.0
# individuals	11	70	73

TAXODIUM

	**T. ascendens (CS)	**T. distichum (CS)	T. distichum (HS)
Diameters (cm)			
Mean	22.9	23.8	26.9
Median	22.1	23.7	22.9
Mode		30.0-30.9	12.0-12.9
Range	8.5-41.1	8.5-39.8	6.6-89.1
# individuals	42	31	74

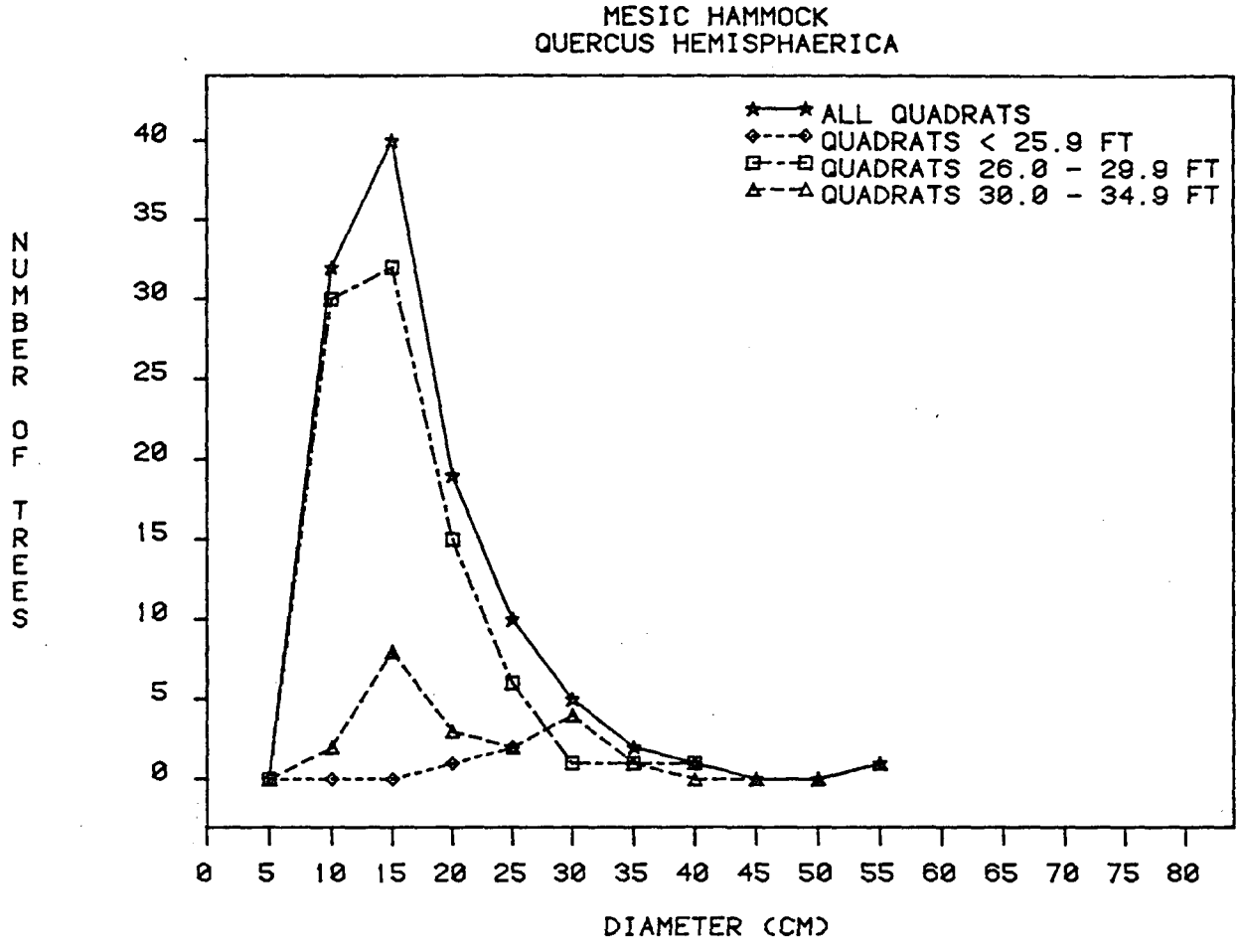
*plot size smaller (75' X 75')
**plot size smaller (55' X 55')
CS = cypress swamp
HS = hardwood swamp

SPECIES DISTRIBUTION

Many species, usually associated with a particular habitat, will occur within a range of vegetation communities and elevation. An analysis of growth patterns in different habitats can serve as an indicator of the growth requirements and moisture tolerance of these species. In the Jane Green Detention Area, four species with high importance values in at least one vegetation community can be evaluated in other communities; namely, Quercus hemisphaerica, Sabal palmetto, Acer rubrum and Taxodium spp.

Quercus hemisphaerica. A dominant species in mesic and hydric hammocks, Q. hemisphaerica was the only oak present in the hardwood swamp quadrats. Although the habitat preference of this species has been described as dry, sandy environments (Kurz and Godfrey, 1980), maximum size was recorded in the hydric hammock and hardwood swamp quadrats (Table 10; Figure 6). In the hydric hammock, Q. hemisphaerica reached a mean diameter of 25.9 cm., more than 11 cm. larger than its mean diameter in the mesic hammock. Modal diameter was also significantly different in the hydric hammock: 14.0-14.9 cm., compared to 9.0-9.9 cm. in the mesic hammock.

Q. hemisphaerica was extremely common in the hammock communities with 110 individuals in the mesic hammock and 81 individuals in the hydric hammock. It was sparsely present in the hardwood swamp, with only 11 individuals in slightly smaller quadrats. The mean diameter of the hardwood swamp trees was still larger than that of the mesic hammock, suggesting the Q. hemisphaerica was responding to the increased availability of water with better growth, but did not have the adaptations to inundation that would allow it to favorably compete with the hydrophytes.



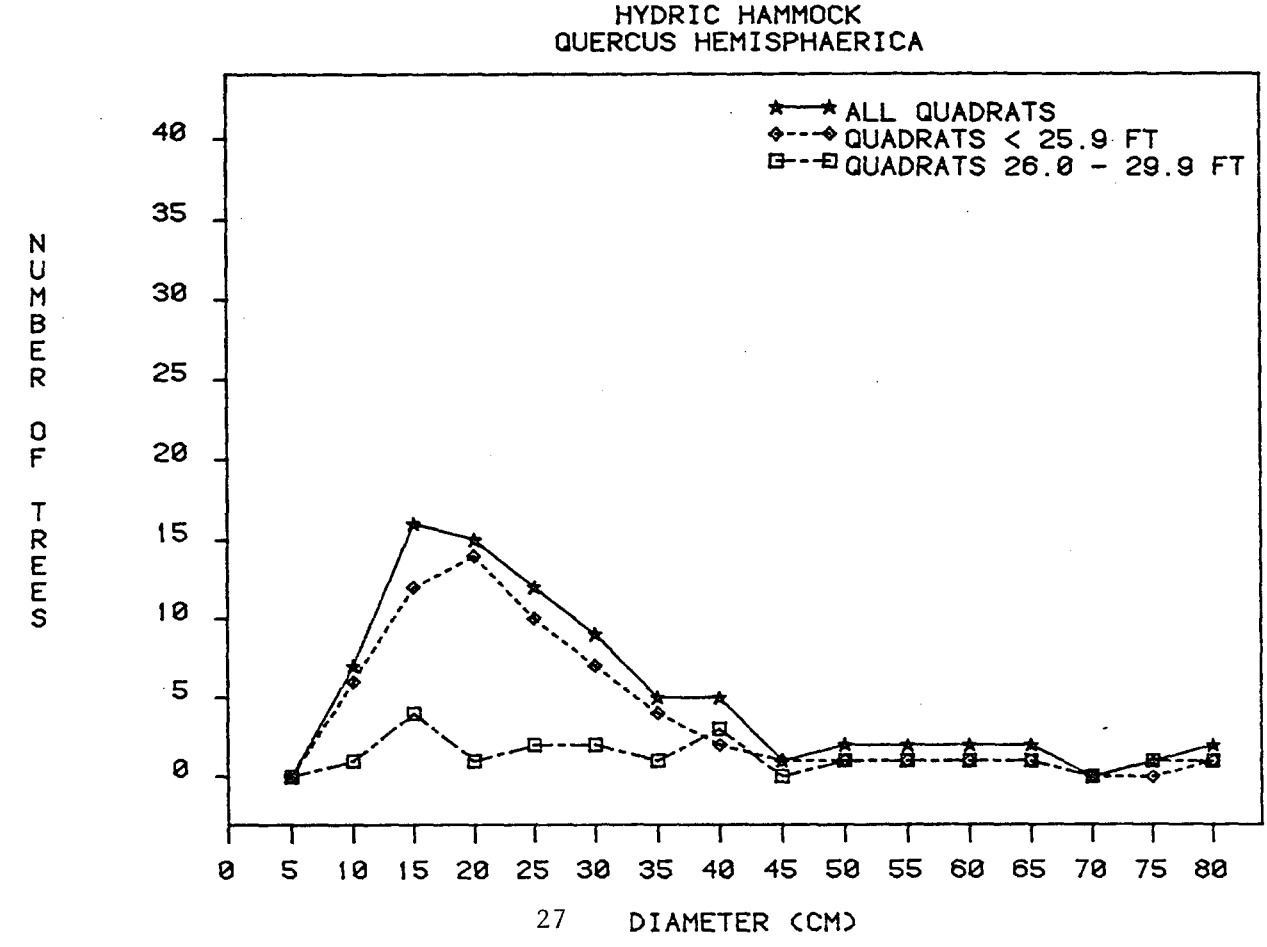


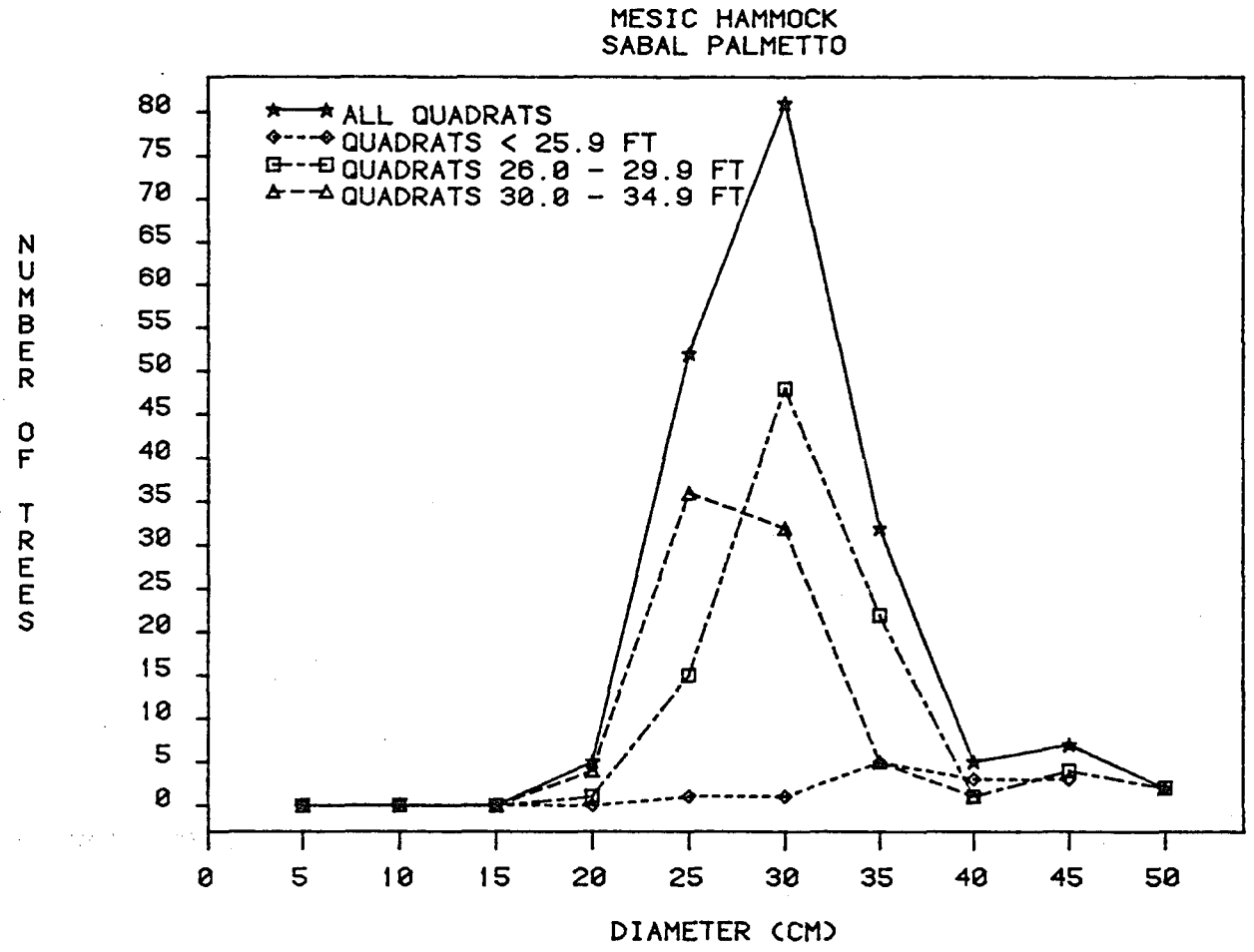
FIGURE 6. --Size/Frequency Distribution of Quercus hemisphaerica in Mesic and Hydric Hammocks.

Sabal palmetto. Sabal palmetto was also a dominant of mesic and hydric hammocks and was minimally represented in the hardwood swamp. It appears to be associated with Q. hemisphaerica in its response to different habitats.

The composite size-frequency curves of S. palmetto in mesic and hydric hammocks were almost identical (Figure 7). Half of the S. palmetto of the hydric hammock and 44% of those of the mesic hammock had diameter of 25-30 cm. Mean and median diameters were within 0.7 cm. of each other across all habitats, although the range varied as much as 30 cm. in different communities (Table 10).

The frequency of occurrence of S. palmetto graphically exhibits its dominance in the hammocks: 184 trees, mesic hammock; 141 trees, hydric hammock and 2 trees in the hardwood swamp. Although the hardwood swamp quadrats were slightly smaller than the hammock quadrats, the decrease in number of individuals is much greater than would be predicted by the ratio of quadrats sizes. The reason for the species virtual disappearance in the swamps may be attributable to a combination of the hydrologic regime of the swamps and the competitive advantage of the hydrophytes Fraxinus caroliniana, Taxodium distichum, and Nyssa biflora. S. palmetto was abundant in the lower elevations (23.0-25.9 ft. msl) of the hydric hammock, where the moisture regime was less intense and the hydrophytes less plentiful.

Acer rubrum. Present in mesic hammocks, hydric hammocks and hardwood swamps, A. rubrum achieved the third highest importance value in the latter two communities. In these two habitats, A. rubrum exhibited a multimodal size distribution curve, with representation in most 5 cm. size intervals, from 5 cm. to 75 cm. The number of individuals present in the hardwood swamp



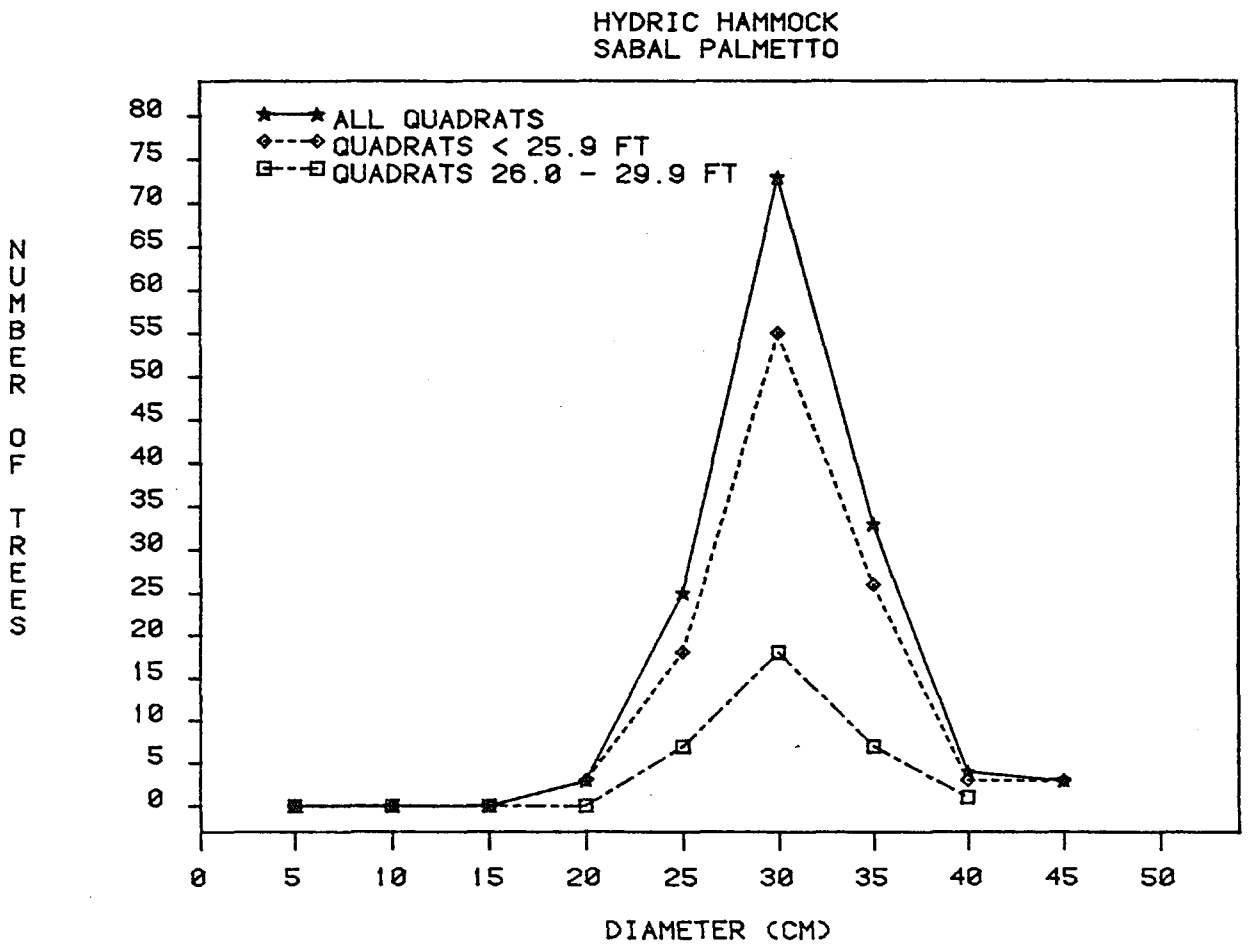
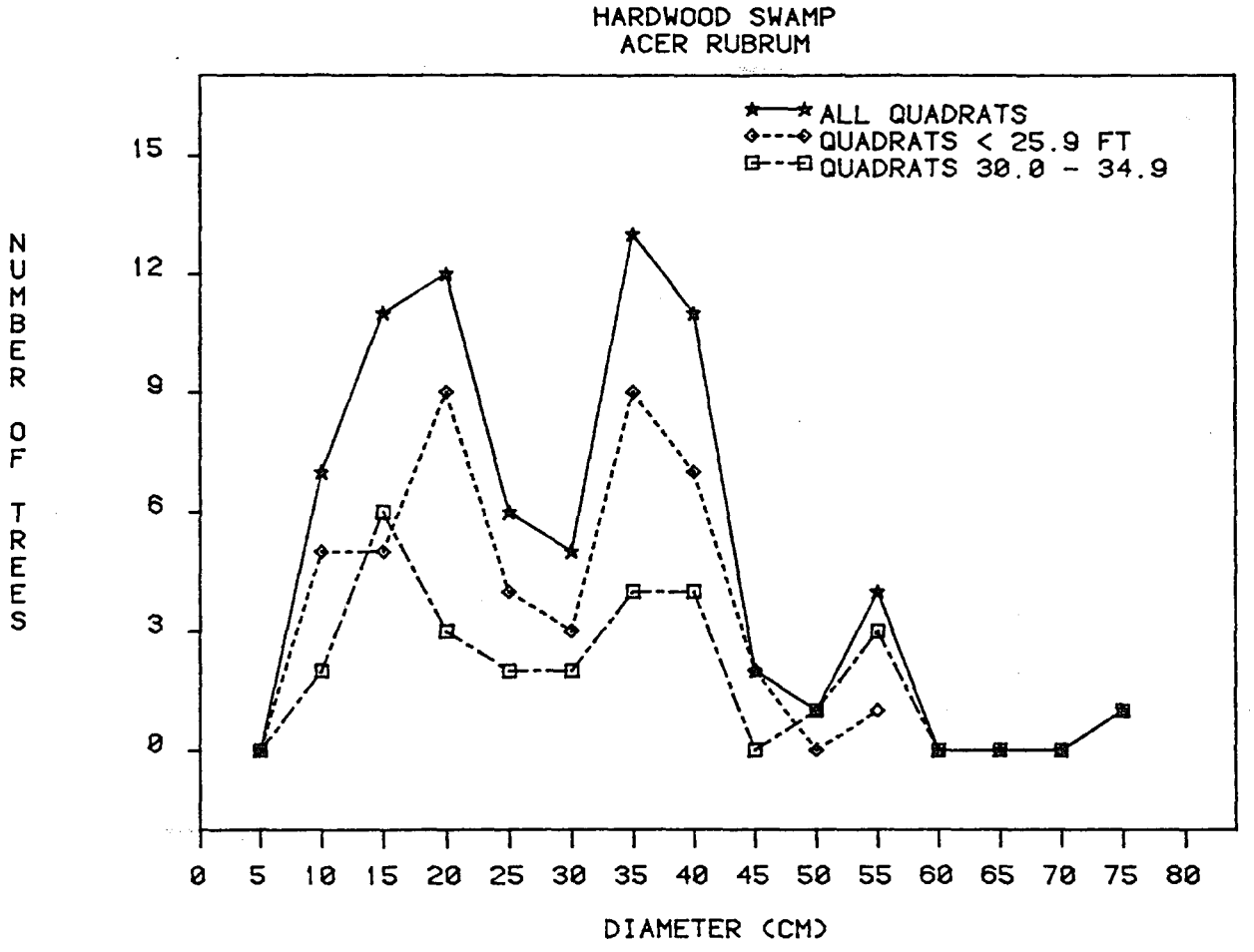


FIGURE 7. --Size/Frequency Distribution of Sabal palmetto in Mesic and Hydric Hammocks.



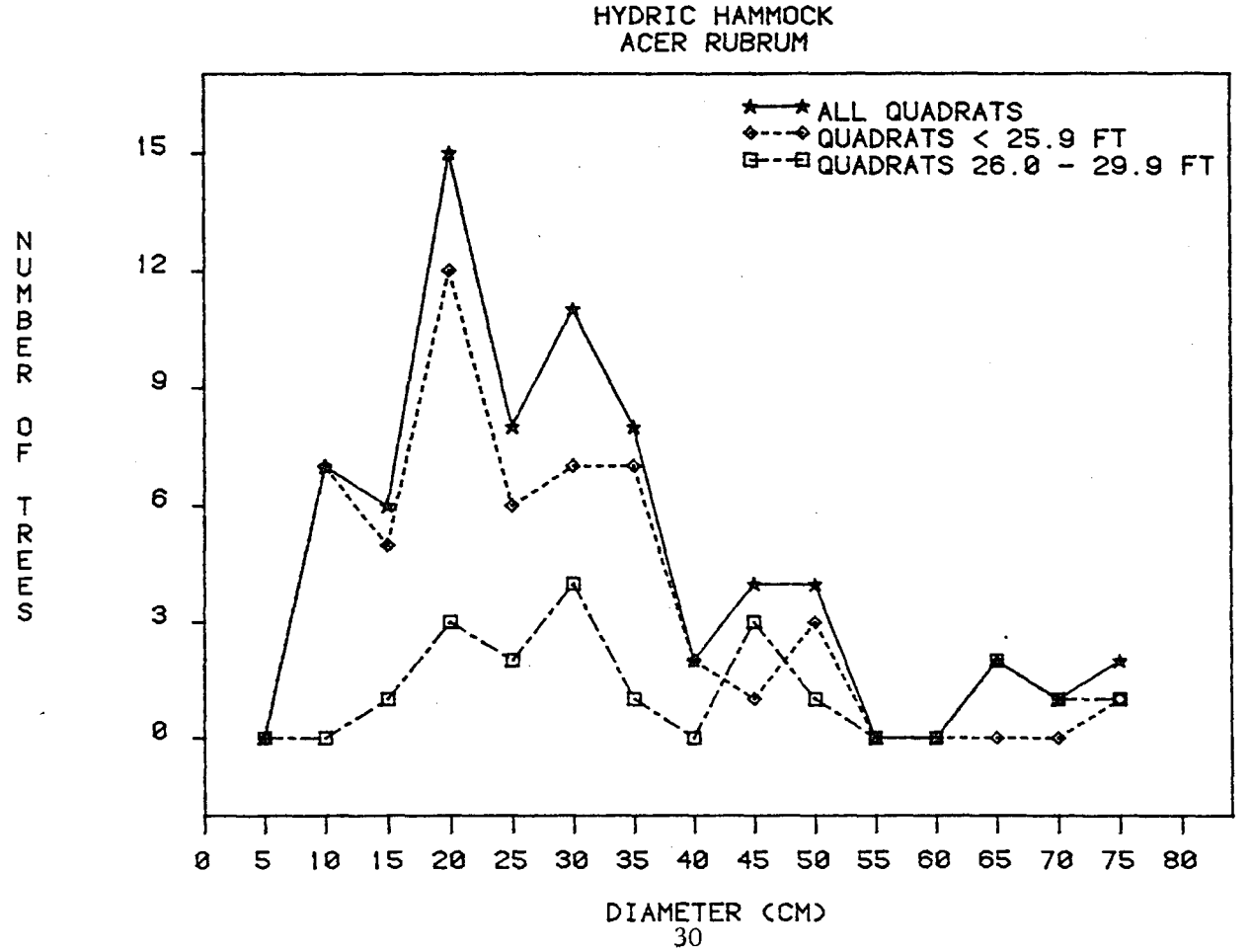
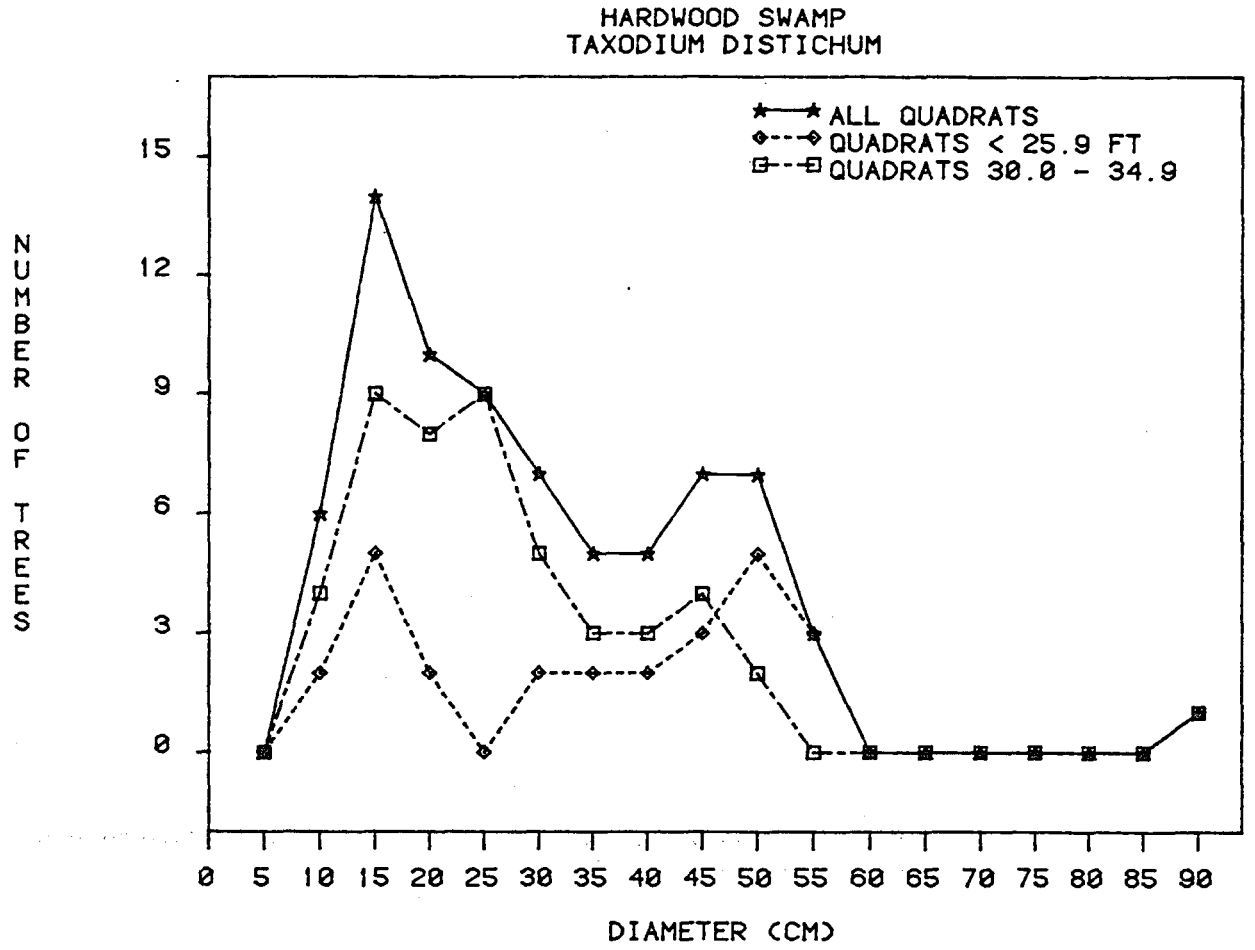


FIGURE 8. --Size/Frequency distribution of Acer rubrum in Hydric Hammock and Hardwood Swamps.

and hydric hammock, and their mean diameter were similar (Tables 2, 3) suggesting the importance of A. rubrum as a secondary species in hydric environments. A. rubrum occurred only in the moister quadrats of the mesic hammock (1, 2). Presence was sporadic (11 individuals out of a total of 165 trees), but the species reached its highest mean diameter (32.0 cm.) in the mesic hammock.

Taxodium spp. Taxodium spp. were dominant in monotypic domes and strands. T. ascendens, found only in cypress domes in this study, was comparable in size to its counterpart in the strand community, T. distichum. Mean diameters were 22.9 cm. and 23.8 cm., respectively, with a range of 8.5-41.1 cm.

T. distichum also occurred in the hardwood swamp, where it had the second highest importance value. Although the median diameter was 22.9 cm., in a range of 6.6-89.1 cm., the modal diameter was 12.0-12.9 cm. However, approximately 24% of the trees had diameters greater than 40 cm. The differences between Taxodium spp. size frequency distributions is the cypress swamp and the hardwood swamp may reflect the relative ages of these communities of differing environmental conditions, but without historical inundation or logging records they cannot be explained.



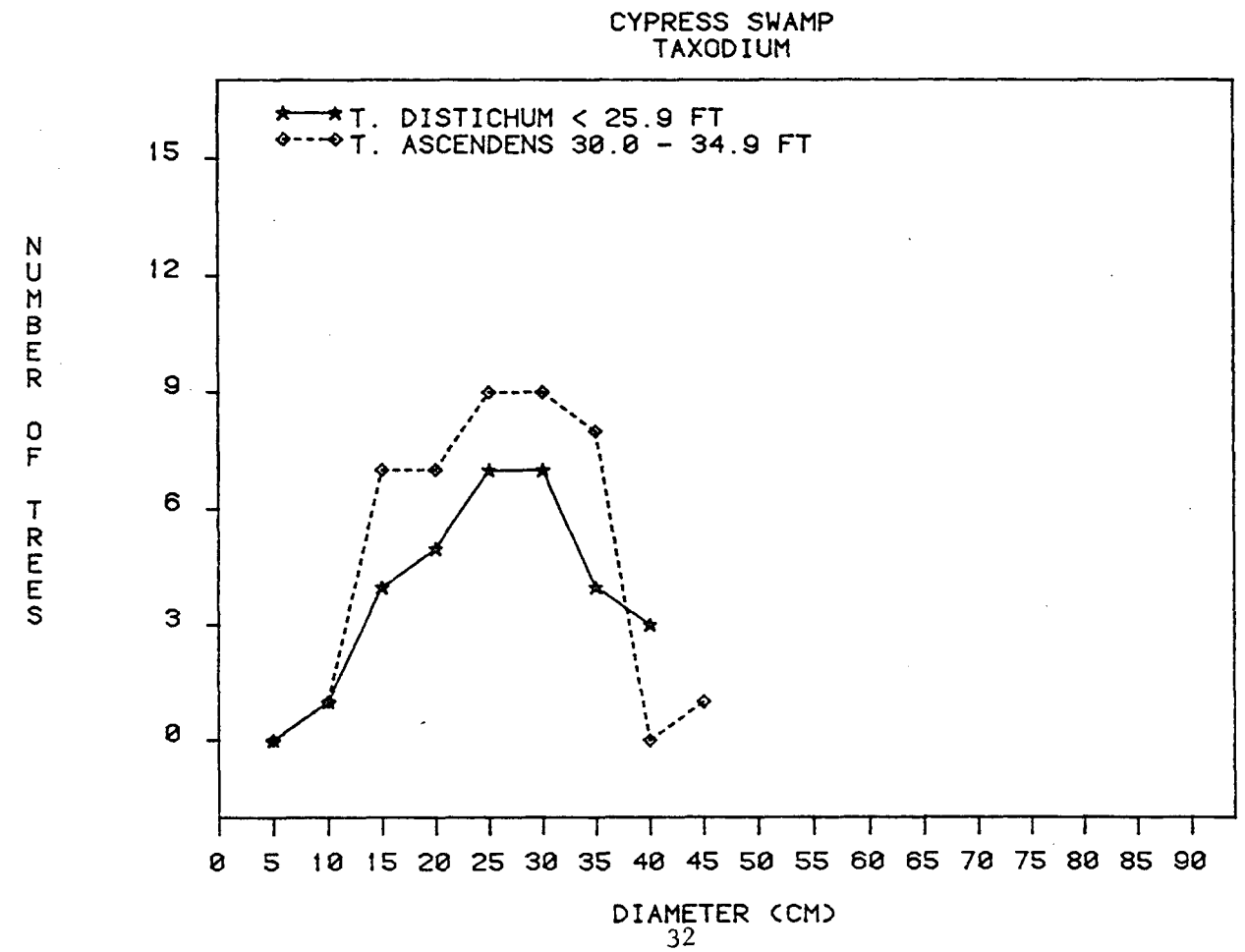


FIGURE 9. --Size/Frequency Distribution of Taxodium in Cypress and Hardwood Swamps.

RELATION OF VEGETATION COMMUNITIES TO REGULATION SCHEDULE

Floodplain species of the Jane Green Detention Area have adapted to a hydroperiod consisting of short periods of high water and longer periods of shallow flooding. Alteration of the hydroperiod to provide water storage will unavoidably subject several vegetation communities to greater than normal depths of inundation. Maximum depths would occur during the first two weeks of flood detention (Table 11). Potential damage to vegetation as a result of exposure to extreme depths include obstruction of stem aeration, accumulation of toxic compounds that may kill or limit the growth of new roots, and mechanical damage to aerial structures due to floating debris. The proposed regulation schedule was designed to minimize these impacts by limiting the duration of deep flooding.

TABLE 11. --Relation of Depth and Duration of Flooding to Vegetation

Communities	Depth and Duration of Inundation				
	2 Days	14 Days	30 Days	60 Days	90 Days
A. Elevation 23.0 - 25.9 ft. msl Hardwood Swamp (Quadrats 21, 22, 27, 28) Cypress Swamp (Quadrats 19, 20) Hydric Hammocks (Quadrats 23, 24, 29, 30) Mesic Hammocks (Quadrats 17, 18)	9.1-22.0 ft.	4.1-11.9 ft.	.1-6.9 ft.	0-2.9 ft.	-------
B. Elevation 26.0 - 29.9 ft. msl Hydric Hammocks (Quadrats 3, 4) Mesic Hammocks (Quadrats 37, 38) Dry Prairies (Quadrats 15, 16, 25, 26)	5.1-19.0 ft.	.1-8.9 ft.	0-3.9 ft.	---------	-------
C. Elevation 30.0 - 34.9 ft. msl Hardwood Swamp (Quadrats 31, 32) Cypress Swamp (Quadrats 11, 12) Mesic Hammock (Quadrats 1, 2) Pine Flatwoods (Quadrats 7, 8) Dry Prairies (Quadrats 13, 14, 33, 34)	.1-15 ft.	0-4.9 ft.	--------	--------	-------
D. Elevation 35.0 - 45.0 ft. msl Dry Prairies (Quadrats 9, 10, 35, 36)	0-10 ft.	--------	--------	--------	-------

SUMMARY AND RECOMMENDATIONS

1. Vegetation of six community types in the Jane Green Detention Area were measured along a moisture gradient to establish a baseline condition from which the impacts of flood detention could be determined.

2. Twenty-four forested quadrats and 12 herbaceous quadrats of sizes ranging from 10,000 sq. ft. to .25 sq. ft. were permanently established in the following communities: hardwood swamp (23.0 - 32.5 ft. msl), cypress swamp (24.0 - 34.7 ft. msl), hydric hammock (24.3 - 30.0 ft. msl), mesic hammock (24.5 - 34.2 ft. msl), dry prairies (26.0 - 54.0 ft. msl), pine flatwoods (29.5 - 35.0 ft. msl).

3. Quadrats were located with respect to elevation ranges of the regulation schedule.

4. Fifty-six percent of all species in the hardwood swamp were found in each hardwood swamp quadrat. Species of high importance value were Fraxinus caroliniana (because of high relative density), Taxodium distichum and Acer rubrum.

5. Sabal palmetto and Quercus hemisphaerica have high importance values in hydric and mesic hammocks. Hydric hammocks can be distinguished from less moist mesic hammocks by the presence of hydrophytes.

6. Two communities were virtually monotypic. Cypress swamps, represented by sloughs and domes were dominated by Taxodium distichum and T. ascendens, respectively. Pine flatwoods consisted of Pinus elliottii.

7. Species with high importance values in more than one community were Quercus hemisphaerica, Sabal palmetto, Acer rubrum and Taxodium spp. Size and frequency distribution may be affected by soil moisture and interspecific competition.

8. Under worst case conditions, impact could potentially occur during the first two weeks of the regulation schedule in communities not normally subject to extensive inundation.

9. Normal growth, mortality and succession may, over time, influence species composition and biomass in the quadrats. It is recommended, if the program is implemented after more than a year's delay, that the quadrats be re-measured.

10. It is also recommended that the quadrats be checked periodically for maintenance.

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APPENDIX A

LOCATION OF TRANSECTS

APPENDIX A

LOCATION OF TRANSECTS

Four transects were established in March 1979 to identify community types representative of the area of possible flood detention; two on Bull Creek and two on Crabgrass Creek. Each began in an upland community, crossed the creek bottomlands, and was terminated when a homogeneous upland community was reached on the other side of the creek. The following tables contain survey data pertaining to transect location. Description of temporary bench marks is included separately.

TRANSECT 1 - Crabgrass Creek

Transect 1 is 5900 feet long, running from Section 20, Township 27S, Range 34E to Section 29, Township 27S, Range 34E.

STATION	ELEVATION NGVD	AZIMUTH	DESCRIPTION
TBM 88	37.05		
0 + 00	37.04	196°	
1 + 00	34.24	196°	palmetto fringe
1 + 13		195.5°	enter mesic hammock
2 + 00	32.68	195.8°	
3 + 00	31.60	196°	
4 + 00	31.08	197°	
4 + 50	31.17	201°	
5 + 00	30.45	183°	
6 + 00	30.05	202°	enter hydric hammock
7 + 00	29.98	202°	
8 + 00	30.02	202°	
9 + 00	30.75	175°	
10 + 00	30.41	173°	
11 + 00	30.57	200°	
12 + 00	30.47	195°	
13 + 00	30.65	152°	
14 + 00	30.10	152°	
15 + 00	28.98	152°	
16 + 00	29.23	152°	
17 + 00	29.53	152°	
TP4	29.78		near C.M. #261; elev. 29.81, 1968
17 + 78	28.15	129°	N. edge of creek
17 + 98	28.17	129°	S. edge of creek
18 + 00	28.68	129°	

TRANSECT 1 (continued)

STATION	ELEVATION NGVD	AZIMUTH	DESCRIPTION
18 + 31	28.21	129°	N. edge of creek
18 + 67	28.32	129°	S. edge of creek
19 + 00	29.94	128°	
19 + 09	28.25	129°	N. edge of creek
19 + 24	28.47	129°	S. edge of creek
20 + 00	30.12	129°	
21 + 00	28.69	224°	
22 + 00	29.77	224°	
22 + 85	28.31	224°	dry creek bed
23 + 00	28.63	224°	
24 + 00	29.63	224°	
25 + 00	29.77	249°	
26 + 00	29.50	249°	enter pine flatwoods
27 + 00	30.18	214°	road
27 + 90	30.38	214°	road
28 + 00	30.45	130°	road
29 + 00	30.27	130°	road
30 + 00	30.24	180°	road
31 + 00	30.30	180°	road
32 + 00	29.74	125°	
33 + 00	30.54	170°	road
34 + 00	31.13	145°	road
35 + 00	30.49	243°	centerline of Cemetery Rd.
36 + 00	30.94	243°	" " " "
37 + 00	30.66	243°	" " " "
38 + 00	30.91	252°	" " " "
39 + 00	30.86	252°	north side of road
40 + 00	31.22	252°	north side of road
41 + 00	31.10	240°	south side of road
42 + 00	31.50	240°	south side of road
43 + 00	31.59	248°	north side of road

TRANSECT 1 (continued)

STATION	ELEVATION NGVD	AZIMUTH	DESCRIPTION
44 + 00	31.50	248°	north side of road
45 + 00	31.92	248°	south side of road
46 + 00	33.02	230°	centerline of road
47 + 00	32.37	230°	south side of road
48 + 00	32.66	250°	followed road
49 + 00	32.57	250°	" "
50 + 00	32.61	250°	" "
51 + 00	32.75	250°	" "
52 + 00	32.94	250°	" "
53 + 00	33.65	250°	" "
54 + 00	34.09	250°	" "
55 + 00	34.99	250°	enter dry prairies
TBM 89	35.47		
56 + 00	36.34	242°	followed road
57 + 00	37.04	252°	" "
58 + 00	37.51	252°	" "
59 + 00	38.47	252°	" "

TRANSECT 2 - Bull Creek

Transect 2 is 4453 feet long, running from Section 10, Township 28S, Range 34E, to Section 9, Township 28S, Range 34E.

STATION	ELEVATION NGVD	AZIMUTH	DESCRIPTION
TBM 86	35.38		
0 + 00	34.31	282°	NNE edge of cypress dome
1 + 00	33.58	282°	
2 + 00	34.02	282°	
2 + 30	34.69	282°	SW edge of cypress dome
2 + 75	35.77	268°	dry prairie
3 + 00	35.99	268°	edge of road
4 + 00	34.74	268°	cross road
5 + 00	33.77	268°	left side of road
6 + 00	32.43	268°	" " " "
6 + 59	31.70	268°	
7 + 00	31.37	280°	
8 + 00	31.00	280°	
9 + 00	30.51	280°	
10 + 00	30.28	280°	
11 + 00	29.58	280°	
12 + 00	29.03	280°	
13 + 00	28.44	280°	
14 + 00	28.01	280°	
14 + 45	27.75	280°	
15 + 00	27.38	244°	
16 + 00	26.69	244°	
17 + 00	26.06	244°	enter mesic hammock
18 + 00	25.20	244°	
19 + 00	24.53	244°	enter cypress swamp
20 + 00	23.92	244°	enter hardwood swamp
21 + 00	23.92	238°	

TRANSECT 2 (continued)

STATION	ELEVATION NGVD	AZIMUTH	DESCRIPTION
22 + 00	23.65	238°	
23 + 00	23.45	238°	
24 + 00	23.37	238°	
25 + 00	23.19	238°	
26 + 00	22.79	238°	
27 + 00	23.38	238°	
28 + 00	23.31	241°	
29 + 00	23.49	238°	
30 + 00	23.53	235°	
31 + 00	23.56	235°	
32 + 00	22.99	238°	
33 + 00	23.60	235°	
34 + 00	23.53	235°	
35 + 00	23.90	235°	
36 + 00	23.71	235°	
37 + 00	24.30	235°	enter hydric hammock
38 + 00	25.20	235°	
39 + 00	25.43	275°	
40 + 00	26.44	275°	enter cypress swamp
41 + 00	25.28	275°	
42 + 00	25.44	275°	
42 + 61	26.18	275°	enter dry prairie
43 + 00	27.43	275°	
44 + 00	28.95	275°	
44 + 53	29.23	275°	
TBM 91	30.30		

TRANSECT 3 - Crabgrass Creek

Transect 3 is 2389 feet long, running from Section 33, Township 27S, Range 34E to Section 4, Township 28S, Range 34E.

STATION	ELEVATION NGVD	AZIMUTH	DESCRIPTION
TBM 87	30.11		
0 + 00	29.64	205°	dry prairies
1 + 00	28.63	205°	
1 + 79	27.93		E of tram road
2 + 00	27.76	205°	
3 + 00	27.61	211°	
3 + 83		211°	Enter palmetto fringe
4 + 00	27.22	211°	
5 + 00	26.34	211°	
5 + 42			Enter hardwood swamp
6 + 00	24.81	211°	
7 + 00	24.39	211°	
8 + 00	23.76	211°	
9 + 00	23.93	211°	
10 + 00	24.25	211°	
11 + 00	23.90	211°	
12 + 00	24.33	211°	
13 + 00	24.20	211°	
14 + 00	24.19	211°	
15 + 00	24.18	211°	
15 + 50	24.20	211°	Creek
16 + 00	24.30	211°	
17 + 00	24.52	211°	Enter hydric hammock
18 + 00	25.69	211°	
19 + 00	25.79	189°	
20 + 00	26.12		Enter mesic hammock
21 + 00	25.98	189°	
22 + 00	26.24	189°	
22 + 77	26.00	189°	

TRANSECT 3 (continued)

STATION	ELEVATION NGVD	AZIMUTH	DESCRIPTION
23 + 00	25.65	238°	
23 + 89	25.03	238°	
TBM 90	25.71		

TRANSECT 4 - Bull Creek

Transect 4 is 2364 feet long, remaining in Section 32, Township 29S 28S and R 34E.

STATION	ELEVATION NGVD	AZIMUTH	DESCRIPTION
TBM 92	34.56		
0 + 00	33.14	300°	
0 + 47		300°	enter hardwood swamp
1 + 00	31.74	300°	
2 + 00	31.47	300°	
3 + 00	31.49	300°	
4 + 00	31.62	300°	
5 + 00	31.13	300°	
5 + 89	31.64	300°	S. edge of Billy Lake
5 + 90	30.73		RR spike in tree, south edge of lake
7 + 08	31.85	329°	N. edge of Billy Lake
8 + 00	32.56	329°	enter dry prairie
9 + 00	33.29	329°	
10 + 00	35.06	329°	
11 + 00	37.24	329°	
12 + 00	40.84	329°	
13 + 00	44.34	342°	
14 + 00	45.24	342°	
15 + 00	47.01	342°	
15 + 75		342°	enter xerophytic oak woodlands
16 + 00	49.31	342°	
17 + 00	50.96	342°	
18 + 00	51.81	342°	
19 + 00	52.36	342°	
20 + 00	53.32	342°	
21 + 00	53.78	342°	enter dry prairie
22 + 00	53.78	342°	

TRANSECT 4 (continued)

STATION	ELEVATION NGVD	AZIMUTH	DESCRIPTION
23 + 00	53.86	342°	
23 + 50	53.95	342°	enter wet prairie
23 + 64	53.20	342°	
TBM 93	54.79		

DESCRIPTION OF TEMPORARY BENCH MARKS

Transect 1 - Crabgrass Creek

TBM 88 Section 20, Township 27S, Range 34E. Stake placed under second section of barbed wire fence from junction of chain link fence. Chain link fence forms the northern boundary on the west side of L-73.

TBM 89 Section 29, Township 27S, Range 34E. Railroad spike set in the side of an eight inch diameter slash pine, 20 feet south of centerline of Cemetery Road. Tree is located at 5500 feet on the transect at the junction of pine flatwoods and dry prairie communities.

Transect 2 - Bull Creek

TBM 86 Section 10, Township 28S, Range 34E. Railroad spike set in a one foot diameter cypress located in the NNE section of a cypress head. Tree is located approximately 100 feet west of drainage ditch behind the scraped borrow area.

TBM 91 Section 9, Township 28S, Range 34E. Railroad spike set in a lone six inch diameter slash pine, 20 feet west of end of transect. Tree is located at the junction of two trail roads which run along the edge of the swamp.

Transect 3 - Crabgrass Creek

TBM 87 Section 33, Township 27S, Range 34E. Railroad spike set in a lone one foot diameter slash pine, 15 feet north of old railroad tram road. Tree is located approximately 300 feet east of hardwood swamp entrance.

TBM 90 Section 4, Township 28S, Range 34E. Railroad spike set in the side of a ten inch diameter cypress tree on the southeast side of a freshwater marsh (flag pond) bordering the west side of the tram road. Cypress tree is approximately 100 feet east of the tram.

Transect 4 - Bull Creek

TBM 92 Section 32, Township 28S, Range 34E. Railroad spike set in the side of a lone 18 inch diameter slash pine approximately 40 feet from the edge of the hardwood swamp. The pine is about 15 feet from the trail road.

TBM 93 Section 32, Township 28S, Range 34E. Railroad spike set in the side of a lone seven inch diameter slash pine 70 feet west of Station 23 + 10. This location is 54 feet from the edge of a wet weather pond of grasses and sedges.

APPENDIX B

LOCATION OF QUADRATS

Appendix B

Location of Quadrats

Refer to Appendix A for detailed information on transect location.

TRANSECT 1 - Crabgrass Creek

Quadrat 1 (mesic hammock) - Quadrat originates at 521 feet from beginning of transect line (TBM 88) and 8 feet to right (west) of line. Coordinates designate the southeast corner of the quadrat; tag tree (1) is located on the northwest corner. Quadrat size is 100 ft. x 100 ft.

Quadrat 2 (mesic hammock) - Quadrat originates at 252 feet from beginning of transect (TBM 88) and 40 feet to the left (east) of line. Coordinates designate the northeast corner of the quadrat; tag tree (2) is located on the southwest corner. Quadrat size is 100 ft. x 100 ft.

Quadrat 3 (hydric hammock) - Quadrat located at 1700 feet from beginning of transect (TBM 88) and 9 feet to the right (west) of the line. Coordinates represent the northwest corner of the quadrat; tag tree (3) is on the southeast corner. Quadrat size is 100 ft. x 100 ft.

Quadrat 4 (hydric hammock) - Quadrat located at 1419 feet from beginning of transect (TBM 88) and 9 feet to the right (west) of the line. Coordinates represent the north corner of the 100 ft. x 100 ft. quadrat; tag tree (4) is on the southeast corner.

Quadrats 5 and 6 (pine flatwoods) - were deleted because field observations indicated it was a mesic transition zone.

Quadrat 7 (pine flatwoods) - Quadrat located at 3068 feet from beginning of transect (TBM 88) and 97 feet to right (west) of line. The coordinates represent the southeast corner of the quadrat, where tag tree (7) is located. Quadrat size is 55 ft. x 55 ft.

Quadrat 8 (pine flatwoods) - Quadrat located at 4462 feet from beginning of transect (TBM 88) and 399 feet to left (east) of line. Coordinates represent the northeast corner of the 55 ft. x 55 ft. quadrat; tagged tree (8) is on southwest corner.

Access to Quadrats 7 and 8 is facilitated by taking Cemetery Road to the end of the transect, and retracing the transect 2832 feet (quadrat 7) and 1438 feet (Quadrat 8).

Quadrats 9 and 10 (dry prairie) - were eliminated due to fire, which swept the area prior to completion of sampling.

TRANSECT 2 - Bull Creek

Quadrat 11 (cypress swamp) - Quadrat is located at 179 feet from beginning of transect (TBM 86) and 52 feet to left (south) of line. Coordinates represent northwest corner; tag tree (11) is proximate to the northeast corner. Quadrat size is 55 ft. x 55 ft.

Quadrat 12 (cypress swamp) - Quadrat is located at 20 feet from beginning of transect (TBM 86) and 16 feet to left (south) of line. Coordinates represent northeast corner of 55 ft. x 55 ft. quadrat; tag tree (12) is located near northwest corner.

Quadrat 13 (dry prairie) - Quadrat is located at 933 feet from beginning of transect (TBM 86) and 25 feet to left (south) of line. Coordinates represent southeast corner of quadrat. Quadrat size for shrubs was 10 ft. x 10 ft.; for herbs, 0.5 ft. x 0.5 ft.

Quadrat 14 (dry prairie) - Quadrat is located at 490 feet from beginning of transect (TBM 86) and 35 feet to left (south) of line. Quadrat size was 10 ft. x 10 ft. for shrubs and 0.5 ft. x 0.5 ft. for herbs.

Quadrat 15 (dry prairie) - Quadrat is located at 1089 feet from beginning of transect (TBM 86) and 83 feet to the right (north) of line. Size was 10 ft. x 10 ft. for shrubs and 0.5 ft. x 0.5 ft. for herbs.

Quadrat 16 (dry prairie) - Quadrat located at 1298 feet from beginning of transect (TBM 86) and 194 feet to left (south) of transect line. Size was 10 ft. x 10 ft. for shrubs, and 0.5 ft. x 0.5 ft. for herbs.

Quadrat 17 (mesic hammock) - Quadrat located at 1787 feet on transect and 27 feet to left (south) of line. Coordinates represent southwest corner of quadrat; tag tree (97) located at northwest corner. Size was 100 ft. x 100 ft.

Quadrat 18 (mesic hammock) - Quadrat located at 1732 feet on transect and 93 feet to right (north) of line. Tag tree (96) located at northwest corner of this 100 ft. x 100 ft. quadrat.

Quadrat 19 (cypress swamp) - Quadrat located at 1906 feet from beginning of transect and 168 feet to left (south) of quadrat line. Coordinates represent northeast corner of quadrat; tag tree (19) just north of southwest

corner. Size of quadrat is 55 ft. x 55 ft.

Quadrat 20 (cypress swamp) - Quadrat located at 1927 feet from beginning of transect (TBM 86) and 93 feet to right (north) of line. Coordinates represent southeast corner of this 55 ft. x 55 ft. quadrat; tagged tree (20) is located in northeast corner.

Quadrat 21 (hardwood swamp) - Quadrat is located at 2934 feet along the transect and 368 feet to left (south) of line. Coordinates represent southeast corner of 75 ft. x 75 ft. quadrat; tag tree (21) is near the northeast corner.

Quadrat 22 (hardwood swamp) - Quadrat is located at 2470 feet along the transect and 64 feet to the right (north) of the line. Coordinates represent the southeast corner of the quadrat; tag tree (22) is located at northeast corner. Quadrat size is 75 feet x 75 feet.

Quadrat 23 (hydric hammock) - Quadrat is located at 3863 feet along the transect and 76 feet to the right (north) of the line. Coordinates delineate southeast corner, tag tree (23) is located at northwest stake. Size of quadrat is 100 ft. x 100 ft.

Quadrat 24 (hydric hammock) - Quadrat is located at 3767 feet along the transect and 48 feet to the left (south) of it. Coordinates represent southeast corner and proximate location of tag tree (24). Size of quadrat is 100 ft. x 100 ft.

TRANSECT 3 - Crabgrass Creek

Quadrat 25 (dry prairie) - Quadrat is located at 88 feet from the beginning of the transect (TBM 87) and 141 feet left (east) of the transect line. Size of quadrat was 10 feet x 10 feet for shrubs and 0.5 feet x 0.5 feet for herbs.

Quadrat 26 (dry prairie) - Quadrat is located at 121 feet from the beginning of the transect (TBM 87) and 129 feet to the left (east) of the line. Size of quadrat was 10 ft. x 10 ft., shrubs and 0.5 ft. x 0.5 ft., herbs.

Quadrat 27 (hardwood swamp) - Quadrat is located at 1290 feet from the beginning of transect (TBM 87) and 5 feet to the right (west) of the line. Coordinates mark the northwest corner of the quadrat; tagged tree (27) is on northeast corner. Size of quadrat is 75 ft. x 75 ft.

Quadrat 28 (hardwood swamp) - Quadrat is located at 932 feet from the beginning of the transect (TBM 87) and 48 feet to the left (east) of it. Coordinates mark the southwest corner of the 75 ft. x 75 ft. quadrat; tagged tree (28) is at northwest corner.

Quadrat 29 (hydric hammock) - Quadrat is located at 1760 feet from beginning of transect (TBM 87) and 47 feet to the left (east) of it. Coordinates represent northwest corner of quadrat; tag tree (29) is located at southwest corner. Size of quadrat is 100 ft. x 100 ft.

Quadrat 30 (hydric hammock) - Quadrat is located at 1885 feet from the beginning of the transect (TBM 87), and 186 feet to the left (east)of it. Coordinates represent the northwest corner of the 100 ft. x 100 ft. quadrat; tag tree (30) is located at the southeast corner.

Quadrat 37 (mesic hammock) - Quadrat is located at 2051 feet from the beginning of the transect (TBM 87), and 68 feet to the right (west) of it. Coordinates mark the northwest corner; tag tree (37) is at the southwest corner. Quadrat size is 100 ft. x 100 ft.

Quadrat 38 (mesic hammock) - Quadrat is located at 2004 feet from beginning of transect (TBM 87) and 33 feet to the left (east) of it. Coordinates mark the northeast corner, where tag tree (38) is located. Quadrat size is 100 ft. x 100 ft.

TRANSECT 4 - Bull Creek

Quadrat 31 (hardwood swamp) - Quadrat is located at 525 feet from beginning of transect (TBM 92) and 34 feet to the left (west) of it. Coordinates mark the southwest corner of the quadrat; tag tree (31) is located at the northeast corner. Quadrat size is 75 ft. x 75 ft.

Quadrat 32 (hardwood swamp) - Quadrat is located at 348 feet from beginning of transect (TBM 92) and 2 feet to the left (west) of it. Coordinates mark the northwest corner; tag tree (32) is located near southwest corner. Quadrat size is 75 ft. x 75 ft.

Quadrat 33 (dry prairie) - Quadrat is located at 7 feet from the beginning of the transect (TBM 92) and 62 feet to the right (east) of it. Coordinates mark the northwest corner. Quadrat size is 10 ft. x 10 ft., shrubs, and 0.5 ft. x 0.5 ft., herbs.

Quadrat 34 (dry prairie) - Quadrat is located at 25 feet from the beginning of the transect (TBM 92) and 38 feet to the left (west) of it. Quadrat size is 10 ft. x 10 ft., shrubs, and 0.5 ft. x 0.5 ft., herbs.

The next two quadrats are located at the opposite side of Billy Lake; distance from both temporary bench marks are indicated.

Quadrat 35 (dry prairie) - Quadrat is located at 1038 feet from the beginning of the transect (TBM 92) and 1326 feet from final TBM 93. Lateral distance from the transect is 58 feet to the right (east). Coordinates mark the southwest corner of the quadrat. Size is 10 ft. x 10 ft., shrubs, and 0.5 ft. x 0.5 ft., herbs.

Quadrat 36 (dry prairie) - Quadrat is located at 1073 feet from the beginning of the transect (TBM 92) and 1291 feet from final TBM 93. Lateral distance from the transect is 47 feet to the left (west) of the line. Coordinates mark the northeast corner of the quadrat. Size is 10 ft. x 10 ft. for shrubs and 0.5 ft. x 0.5 ft. for herbs.

APPENDIX C

DESCRIPTIVE MEASURES FOR VEGETATION COMMUNITIES BY QUADRATS

KEY TO ABBREVIATIONS

Habitat

CS = cypress swamp
HH = hydric hammock
RS = hardwood swamp
MH = mesic hammock
PF = pine flatwoods

Date: Month, day, year

#: number of species

Species

B = blue beech (Carpinus caroliniana)
BC = bald cypress (Taxodium distichum)
BG = blackgum (Nyssa biflora)
CA = Carolina ash (Fraxinus caroliniana)
CP = cabbage palm (Sabal palmetto)
DH = dahoon holly (Ilex cassine)
DO = dwarf live oak (Quercus minima)
E = American elm (Ulmus americana)
LO = laurel oak (Quercus hemisphaerica)
MR = red mulberry (Morus rubra)
PC = pond cypress (Taxodium ascendens)
QV = live oak (Quercus virginiana)
RM = red maple (Acer rubrum)
SD = swamp dogwood (Cornus stricta)
SG = sweetgum (liquidambar styraciflua)
SP = slash pine (Pinus elliottii)
SQ = sand live oak (Quercus geminata)
WH = water hickory (Carya aquatica)
WL = honey-locust (Gleditsia triacanthos)
WO = water oak (Quercus nigra)

N: number of trees

Total diameter = sum of diameters, in centimeters

Total basal area = sum of basal area, in cm2

$$\text{Relative dominance} = \frac{\text{basal area of species A}}{\text{total basal area all species}}$$

$$\text{Relative density} = \frac{\text{total individuals of species A}}{\text{total individuals of all species}}$$

$$\text{Total frequency} = \frac{\text{number plots in which species occurred}}{\text{total number of plots}}$$

$$\text{Relative frequency} = \frac{\text{frequency value of species A}}{\text{frequency value of all species}}$$

$$\text{Importance value} = \text{relative dominance} + \text{relative density} + \text{relative frequency}$$

JANE GREEN DETENTION AREA
HABITAT - MESIC HAMMOCK

TRANSECT 1, QUADRAT 1, ELEVATION 30.0 - 34.9
DATE - 4-9-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	SG	15	357.1	8482.2	19.0	21.3	9.5	49.8	33.3
2	CP	35	894.9	18257.0	44.3	45.7	28.6	118.6	100.0
3	LO	15	297.3	5155.5	19.0	12.9	23.8	55.7	83.3
4	RM	8	250.3	6972.8	10.1	17.5	9.5	37.1	33.3
5	E	4	63.1	866.3	5.1	2.2	14.2	21.5	50.0
6	BG	1	11.8	109.3	1.3	0.3	9.5	11.1	33.3
7	BC	1	9.5	70.8	1.3	0.2	4.7	6.2	16.6
	TOTALS	79	1884.0	39913.8	100.0	100.0	99.8	300.0	

TRANSECT 1, QUADRAT 2, ELEVATION 30.0 - 34.9
DATE - 4-9-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	E	5	134.1	2874.3	5.8	6.7	13.6	26.1	50.0
2	CP	43	1083.3	21914.8	50.0	50.7	27.3	128.0	100.0
3	SG	23	471.5	10516.4	26.7	24.3	9.1	60.1	33.3
4	LO	6	124.2	3337.8	7.0	7.7	22.7	37.4	83.3
5	BG	4	67.0	911.6	4.7	2.1	9.1	15.9	33.3
6	RM	3	101.9	3274.7	3.5	7.6	9.1	20.2	33.3
7	MR	1	16.0	201.0	1.2	0.5	4.5	6.2	16.6
8	WH	1	15.0	176.6	1.2	0.4	4.5	6.1	16.6
	TOTALS	86	2013.0	43207.1	100.0	100.0	99.9	300.0	

JANE GREEN DETENTION AREA
HABITAT - MESIC HAMMOCK

TRANSECT 2, QUADRAT 17, ELEVATION 23.0 - 25.9
DATE - 4-27-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	CP	5	189.7	5726.3	26.3	35.3	37.5	99.1	100.0
2	LO	3	60.5	968.2	15.8	6.0	31.3	53.1	83.3
3	QV	9	305.5	9206.0	47.4	56.7	12.5	116.6	33.3
4	WO	1	10.8	91.6	5.3	0.6	6.2	12.1	16.6
5	SP	1	17.8	248.7	5.3	1.5	12.5	19.3	33.3
	TOTALS	19	584.3	16240.8	100.0	100.0	100.0	300.2	

TRANSECT 2, QUADRAT 18, ELEVATION 23.0 - 25.9
DATE - 4-27-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	CP	8	251.7	6348.7	66.7	68.7	50.0	185.4	100.0
2	QV	2	79.8	2714.4	16.7	29.4	16.7	62.8	33.3
3	SQ	1	12.7	126.6	8.3	1.4	8.3	18.0	16.6
4	E	1	8.0	50.2	8.3	0.5	25.0	22.8	50.0
	TOTALS	12	352.2	9239.9	100.0	100.0	100.0	300.0	

JANE GREEN DETENTION AREA
HABITAT - MESIC HAMMOCK

TRANSECT 3, QUADRAT 37, ELEVATION 26.0 - 29.9
DATE - 7-23-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	CP	38	1106.0	26073.0	46.3	83.1	46.2	175.6	100.0
2	LO	41	487.1	5152.8	50.0	16.4	38.4	104.8	83.3
3	DO	3	23.6	159.4	3.7	0.5	15.4	19.6	33.3
	TOTALS	82	1616.7	31385.3	100.0	100.0	100.0	300.0	

TRANSECT 3, QUADRAT 38, ELEVATION 26.0 - 29.9
DATE - 7-23-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	CP	55	1601.2	37884.9	50.9	78.1	40.0	169.0	100.0
2	LO	45	631.1	8176.7	41.7	16.9	33.3	91.9	83.3
3	SP	2	50.6	1115.7	1.9	2.3	13.3	17.5	33.3
4	DO	6	93.9	1304.0	5.6	2.7	13.3	21.6	33.3
	TOTALS	108	2376.8	48481.3	100.0	100.0	99.9	300.0	

JANE GREEN DETENTION AREA
HABITAT - HYDRIC HAMMOCK

TRANSECT 1, QUADRAT 3, ELEVATION 26.0 - 29.9
DATE - 4-9-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	BG	1	9.8	75.4	1.8	0.1	12.5	14.4	83.3
2	RM	16	600.8	22184.9	28.1	39.7	15.0	82.8	100.0
3	E	10	214.3	4624.1	17.5	8.3	15.0	40.8	100.0
4	LO	10	454.1	19457.3	17.5	34.8	15.0	67.3	100.0
5	CA	6	73.6	811.2	10.5	1.5	10.0	22.0	66.6
6	CP	6	173.3	4021.4	10.5	7.2	15.0	32.7	100.0
7	B	1	8.4	55.4	1.8	0.1	5.0	6.9	33.3
8	SG	6	155.9	3588.7	10.5	6.4	5.0	21.9	33.3
9	WH	1	36.4	1040.1	1.8	1.9	7.5	11.2	50.0
	TOTALS	57	1726.6	55858.5	100.0	100.0	100.0	300.0	

TRANSECT 1, QUADRAT 4, ELEVATION 26.0 - 29.9
DATE - 4-9-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	B	26	350.7	4194.7	30.6	10.3	4.9	45.8	33.3
2	CP	27	737.1	16000.4	31.8	39.5	14.6	85.9	100.0
3	LO	10	245.4	6062.7	11.8	15.0	14.6	41.4	100.0
4	WH	3	136.3	5721.8	3.5	14.1	7.3	24.9	50.0
5	SG	8	181.6	4060.1	9.4	10.0	4.9	24.3	33.3
6	BC	3	51.6	697.5	3.5	1.7	12.2	17.4	83.3
7	BG	4	73.4	1098.0	4.7	2.7	12.2	19.6	83.3
8	RM	3	90.7	2468.7	3.5	6.1	14.6	24.2	100.0
9	E	1	17.8	248.7	1.2	0.6	14.6	16.4	100.0
	TOTALS	85	1884.6	40552.7	100.0	100.0	99.9	299.9	

JANE GREEN DETENTION AREA
HABITAT - HYDRIC HAMMOCK

TRANSECT 2, QUADRAT 23, ELEVATION 23.0 - 25.9
DATE - 4-30-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	LO	30	637.4	14806.2	34.9	47.0	14.6	96.5	100.0
2	E	18	220.6	2718.1	20.9	8.6	14.6	44.1	100.0
3	SD	1	5.1	20.4	1.2	0.1	2.4	3.7	16.6
4	BG	3	32.2	275.6	3.5	0.9	12.2	16.6	83.3
5	RM	19	384.5	7559.3	22.1	24.0	14.6	60.7	100.0
6	CP	5	180.6	5138.6	5.8	16.3	14.6	36.7	100.0
7	DH	2	22.3	196.6	2.3	0.6	4.9	7.8	33.3
8	CA	6	66.5	635.7	7.0	2.0	9.7	18.7	66.6
9	BC	2	19.9	159.2	2.3	0.5	12.2	15.0	83.3
	TOTALS	86	1569.1	31509.8	100.0	100.0	99.8	299.8	

TRANSECT 2, QUADRAT 24, ELEVATION 23.0 - 25.9
DATE - 4-29-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	RM	18	437.8	10517.9	22.8	29.9	15.0	67.7	100.0
2	E	16	246.7	3654.4	20.3	10.4	15.0	45.7	100.0
3	DH	2	21.4	180.3	2.5	0.5	5.0	8.0	33.3
4	LO	9	200.9	4992.7	11.4	14.2	15.0	40.6	100.0
5	CP	26	697.7	14836.0	32.9	42.1	15.0	90.0	100.0
6	BC	4	41.9	476.6	5.1	1.4	12.5	19.0	83.3
7	CA	3	42.9	535.3	3.8	1.5	10.0	15.3	66.6
8	BG	1	5.9	27.3	1.3	0.1	12.5	13.9	83.3
	TOTALS	79	1695.2	35220.6	100.0	100.0	100	300.2	

JANE GREEN DETENTION AREA
HABITAT - HYDRIC HAMMOCK

TRANSECT 3, QUADRAT 29, ELEVATION 23.0 - 25.9
DATE - 4-8-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	RM	12	318.3	9015.8	14.3	19.8	15.8	49.9	100.0
2	CP	30	861.5	19868.7	35.7	43.7	15.8	95.2	100.0
3	CA	4	51.6	532.0	4.8	1.2	10.5	16.5	66.6
4	E	15	248.6	3766.9	17.9	8.3	15.8	42.0	100.0
5	BC	12	207.7	3197.9	14.3	7.0	13.1	34.4	83.3
6	BG	1	11.3	100.2	1.2	0.2	13.1	14.5	83.3
7	LO	10	285.7	8971.0	11.9	19.7	15.8	47.4	100.0
	TOTALS	84	1984.7	45452.6	100.0	100.0	99.9	299.9	

TRANSECT 3, QUADRAT 30, ELEVATION 23.0 - 25.9
DATE - 4-8-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCT VALUE	TOTAL FREQUENCY
1	E	2	44.3	848.3	3.0	2.2	18.2	23.4	100.0
2	CP	47	1323.1	29896.1	70.1	76.8	18.2	165.1	100.0
3	LO	12	276.8	5313.0	17.9	13.6	18.2	49.7	100.0
4	WH	1	29.7	692.4	1.5	1.8	9.1	12.4	50.0
5	RM	2	53.2	1111.1	3.0	2.9	18.2	24.1	100.0
6	BC	2	37.2	552.2	3.0	1.4	15.1	19.5	83.3
7	SP	1	25.7	518.5	1.5	1.3	3.0	5.8	16.6
	TOTALS	67	1790.0	38931.5	100.0	100.0	100.0	300.0	

JANE GREEN DETENTION AREA
HABITAT - HARDWOOD SWAMP

TRANSECT 2, QUADRAT 21, ELEVATION 23.0 - 25.9
DATE - 4-30-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	CA	81	1139.0	15259.8	68.6	39.0	15.8	123.4	100.0
2	RM	14	388.9	9577.8	11.9	24.5	15.8	52.2	100.0
3	DH	4	35.8	290.1	3.4	0.7	5.3	9.4	33.3
4	BG	4	128.6	5180.9	3.4	13.2	15.8	32.4	100.0
5	LO	3	69.3	1613.2	2.5	4.1	10.5	17.1	66.6
6	E	4	69.8	1044.7	3.4	2.7	15.8	21.9	100.0
7	BC	7	192.2	5490.3	5.9	14.0	15.8	35.7	100.0
8	CP	1	29.0	660.2	0.8	1.7	5.3	7.8	33.3
	TOTALS	118	2052.6	39116.9	100.0	100.0	100.1	299.9	

TRANSECT 2, QUADRAT 22, ELEVATION 23.0 - 25.9
DATE - 4-28-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	CA	151	1942.6	24193.1	84.4	68.4	16.2	169.0	100.0
2	BC	4	110.0	3080.1	2.2	8.7	16.2	27.1	100.0
3	DH	2	14.8	86.5	1.1	0.2	5.4	6.7	33.3
4	RM	10	161.0	2559.6	5.6	7.2	16.2	29.0	100.0
5	WL	2	70.1	1950.8	1.1	5.5	2.7	9.3	16.6
6	LO	3	50.5	699.2	1.7	2.0	10.8	14.5	66.6
7	E	6	76.7	859.6	3.4	2.4	16.2	22.0	100.0
8	BG	1	49.7	1939.0	0.6	5.5	16.2	22.3	100.0
	TOTALS	179	2475.4	35368.0	100.0	100.0	99.9	299.9	

JANE GREEN DETENTION AREA
HABITAT - HARDWOOD SWAMP

TRANSECT 3, QUADRAT 27, ELEVATION 23.0 - 25.9
DATE - 4-8-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	CA	33	548.9	8006.8	55.0	26.9	17.6	99.5	100.0
2	BG	3	105.7	3100.2	5.0	10.4	17.6	33.0	100.0
3	LO	3	68.1	1723.7	5.0	5.8	11.8	22.6	66.6
4	BC	5	217.3	8485.5	8.3	28.5	17.6	54.4	100.0
5	RM	12	286.9	6762.9	20.0	22.7	17.6	60.3	100.0
6	E	4	84.9	1718.6	6.7	5.8	17.6	30.1	100.0
	TOTALS	60	1311.8	29797.7	100.0	100.0	99.8	299.9	

TRANSECT 3, QUADRAT 28, ELEVATION 23.0 - 25.9
DATE - 4-8-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCE	IMPORTANCE VALUE	TOTAL FREQUENCY
1	CA	47	803.6	11997.1	61.8	37.6	16.7	116.1	100.0
2	RM	9	285.4	7560.7	11.8	23.7	16.7	52.2	100.0
3	E	6	113.6	2159.1	7.9	6.8	16.7	31.4	100.0
4	BC	10	302.0	8332.7	13.2	26.1	16.7	56.0	100.0
5	BG	1	25.2	498.5	1.3	1.6	16.7	19.6	100.0
6	LO	2	44.5	814.2	2.6	2.5	11.1	16.2	66.6
7	CP	1	27.2	580.8	1.3	1.8	5.5	8.6	33.3
	TOTALS	76	1601.5	31943.0	100.0	100.0	100.1	300.1	

JANE GREEN DETENTION AREA
HABITAT - HARDWOOD SWAMP

TRANSECT 4, QUADRAT 31, ELEVATION 30.0 - 34.9
DATE - 4-29-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	BG	4	93.4	1872.5	5.7	4.5	20.0	30.2	100.0
2	BC	25	806.7	25160.3	35.7	59.9	20.0	115.6	100.0
3	CA	26	430.5	6156.9	37.1	14.7	20.0	71.8	100.0
4	RM	11	286.6	8401.7	15.7	20.0	20.0	55.7	100.0
5	E	4	43.5	387.1	5.7	0.9	20.0	26.6	100.0
	TOTALS	70	1660.7	41978.5	100.0	100.0	100.0	299.9	

TRANSECT 4, QUADRAT 32, ELEVATION 30.0 - 34.9
DATE - 4-29-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	BC	23	361.3	4988.4	24.7	16.5	20.0	61.2	100.0
2	CA	43	637.1	8031.8	46.2	26.6	20.0	92.8	100.0
3	RM	17	511.8	14993.7	18.3	49.7	20.0	88.0	100.0
4	E	3	37.9	399.9	3.2	1.3	20.0	24.5	100.0
5	BG	7	110.5	1750.4	7.5	5.8	20.0	33.3	100.0
	TOTALS	93	1658.6	30164.1	100.0	100.0	100.0	299.8	

JANE GREEN DETENTION AREA
HABITAT - PINE FLATWOODS

TRANSECT 1, QUADRAT 7, ELEVATION 30.0 - 34.9
DATE - 4-7-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	SP	14	308.6	5477.4	93.3	81.8	66.7	241.8	100.0
2	CP	1	39.4	1218.6	6.7	18.2	33.3	58.2	50.0
	TOTALS	15	348.0	6696.0	100.0	100.0	100.0	300.0	

TRANSECT 1, QUADRAT 8, ELEVATION 30.0 - 34.9
DATE - 4-7-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	SP	14	281.9	4864.3	100.0	100.0	100.0	300.0	100.0

JANE GREEN DETENTION AREA
HABITAT - CYPRESS SWAMP

TRANSECT 2, QUADRAT 11, ELEVATION 30.0 - 34.9
DATE - 4-10-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	PC	14	354.0	7780.4	100.0	100.0	100.0	300.0	50.0

TRANSECT 2, QUADRAT 12, ELEVATION 30.0 - 34.9
DATE - 4-10-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	PC	28	606.0	11349.0	96.6	93.0	40.0	229.6	50.0
2	BG	1	33.0	854.9	3.4	7.0	60.0	70.4	75.0
	TOTALS	29	639.6	12203.9	100.0	100.0	100.0	300.0	

JANE GREEN DETENTION AREA
HABITAT - CYPRESS SWAMP

TRANSECT 2, QUADRAT 19, ELEVATION 23.0 - 25.9
DATE - 4-29-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	CA	2	32.0	468.3	14.3	5.8	16.7	36.8	25.0
2	BC	11	307.7	7088.6	78.6	88.3	33.3	200.2	50.0
3	BG	1	24.5	471.2	7.1	5.9	50.0	63.0	75.0
	TOTALS	14	364.2	8028.0	100.0	100.0	100.0	300.0	

TRANSECT 2, QUADRAT 20, ELEVATION 23.0 - 25.9
DATE - 4-29-81

#	SPECIES	N	TOTAL DIAMETER	TOTAL BASAL AREA	RELATIVE DENSITY	RELATIVE DOMINANCE	RELATIVE FREQUENCY	IMPORTANCE VALUE	TOTAL FREQUENCY
1	BC	20	430.6	8114.0	95.2	91.5	40.0	226.7	50.0
2	BG	1	30.9	749.5	4.8	8.5	60.0	73.3	75.0
	TOTALS	21	461.5	8863.5	100.0	100.0	100.0	300.0	

APPENDIX D

RAW DATA

KEY TO ABBREVIATIONS

Heading

1st Character = Jane Green Detention Area

2nd Character = day

3rd Character = month

4th Character = year

5th Character = transect

6th Character = quadrat

7th Character = habitat, where:

MH = Mesic hammock
HH = Hydric hammock
HS = Hardwood swamp
PF = Pine flatwoods
CS = Cypress swamp

8th Character = minimum elevation of quadrat occurrence

9th Character = maximum elevation of quadrat occurrence

Data

1st Character = proximate location of data point within quadrat. Quadrats were divided into ten feet wide strips; number indicates which strip data point is in.

2nd Character = Species, where:

B = blue beech (*Caprinus caroliniana*)
BC = bald sypress (*Taxodium distichum*)
BG = blackgum (*Nyssa biflora*)
CA = Carolina ash (*Fraxinus caroliniana*)
CP = cabbage palm (*Sabal palmetto*)
DH = dahoon holly (*Ilex cassine*)
DO = dwarf live oak (*Quercus minima*)
E = American elm (*Ulmus americana*)
LO = laurel oak (*Quercus hemisphaerica*)
MR = red mulberry (*Morus rubra*)
PC = pond cypress (*Taxodium ascendens*)
OV = live oak (*Quercus virginiana*)
RM = red maple (*Acer rubrum*)
SD = swamp dogwood (*Cornus stricta*)
SG - sweet gum (*Liquidambar styraciflua*)

2nd Character (continued)

SP = slash pine (Pinus elliottii)
SQ = sand live oak (Quercus geminata)
WH = water hickory (Carya aquatica)
WL = honey-locust (Gleditsia triacanthos)
WO = water oak (Quercus nigra)

3rd Character = diameter (dbh), in centimeters

* = tagged trees

JG 9 4 81 1 1 MH 30.0 34.9

1	SG	11.3
1	SG	16.3
1	CP	24.9
1	SG	28.4
1	SG	12.9
1	SG	18.5
1	LO	19.6
2	LO	11.1
2	CP	23.8
2	CP	21.2
2	LO	12.1
2	CP	21.6
3	RM	28.3
3	RM	24.7
3	RM	45.8
3	E	22.9
3	CP	27.3
3	CP	16.9
3	CP	26.2
3	BG	11.8
3	SG	12.9
4	CP	31.8
4	CP	25.0
4	RM	28.6
4	CP	27.7
4	CP	27.2
4	LO	32.6
4	SG	46.9
5	BC	9.5
5	SG	12.8
5	CP	32.0
5	CP	29.4
5	LO	14.6
5	CP	24.2
5	SG	31.5
5	LO	19.2
5	LO	26.1
5	CP	27.2
5	CP	25.6
5	CP	25.2
5	CP	21.0
5	E	18.5
6	CP	26.9
6	CP	25.0
6	LO	28.9
6	CP	29.2
6	RM	10.6
6	CP	27.6
6	LO	13.8
6	E	10.0
6	SG	46.8
7	SG	13.5
7	SG	15.6
7	CP	26.7
7	CP	27.5
7	CP	22.0
8	CP	21.1
8	LO	13.5
8	CP	24.5
8	LO	28.3
8	CP	21.8
8	CP	26.6
8	LO	18.0
8	SG	40.9
8	SG	17.5
8	E	11.7
9	RM	26.4
9	CP	28.9
9	CP	28.2
9	RM	48.3
9	SG	31.3
9	LO	24.0
10	RM	37.6
10	CP	25.0 *
10	CP	28.8
10	CP	20.3
10	LO	22.7
10	CP	26.6
10	LO	12.8

JG 9 4 81 1 2 MH 30.0 34.9

1	E	27.2
1	CP	19.5
1	CP	27.9
1	SG	11.4
1	CP	19.6
1	LO	8.5
1	CP	19.0
1	CP	22.0
1	CP	23.0
2	SG	28.9
2	CP	28.0
2	CP	28.8
2	LO	54.7
3	BG	18.6
3	SG	27.7
3	SG	18.6
3	CP	30.0
3	CP	22.8
3	CP	22.5
3	SG	10.8
3	E	26.1
3	RM	13.0
4	CP	27.4
4	CP	20.3
4	SG	19.5
4	CP	27.6
4	RM	49.5
4	SG	60.6
4	CP	30.9
4	E	29.9
4	CP	28.2
4	SG	44.7
5	E	20.4
5	CP	23.5
5	CP	20.1
5	CP	22.6
5	CP	21.7
5	CP	23.7
5	CP	24.8
5	CP	22.3
5	CP	32.8
6	SG	32.8
6	LO	8.8
6	E	30.5
6	CP	24.9
7	BG	16.1
7	SG	9.4
7	CP	27.6
7	BG	20.3
7	RM	39.4
7	CP	24.5
7	CP	21.2
7	CP	36.1
7	CP	26.8
7	CP	28.6
7	LO	29.0
7	SG	16.8
7	LO	11.8
7	CP	32.5
7	CP	23.0
8	CP	24.5
8	CP	22.0
8	LO	11.4
8	SG	13.0
8	SG	11.5
9	MR	16.0
9	CP	27.0
9	SG	14.5
9	SG	19.7
9	SG	15.5
9	CP	25.0
9	CP	24.7
9	SG	10.3
10	CP	26.7
10	SG	10.3
10	BG	12.0
10	CP	27.6
10	SG	10.3
10	CP	25.6
10	WH	15.0
10	CP	24.7
10	SG	12.4
10	SG	18.5
10	CP	21.3
10	SG	15.4
10	SG	38.9 *

JG 9 4 81 1 3 HH 26.0 29.9

1	BG	9.8		7	E	14.4	
1	RM	26.0		7	RM	25.7	
1	E	30.5		7	E	16.2	
1	LO	72.8		7	E	12.4	
1	E	29.9		8	LO	26.1	
1	CA	10.1	*	8	LO	62.5	
1	CA	8.7		8	LO	35.8	
2	CP	25.6		8	RM	13.0	
2	RM	61.8		8	RM	43.2	
2	B	8.4		8	RM	67.4	
3	E	9.1		8	RM	71.5	
3	RM	15.7		9	SG	25.5	
3	RM	24.6		9	CP	27.3	
3	RM	27.6		9	RM	15.8	
3	CA	9.3		9	LO	37.9	
3	LO	77.0		9	CP	32.3	
4	LO	14.6		9	CA	12.1	
4	E	49.1		10	CP	35.5	
4	SG	36.5		10	LO	49.5	
4	CP	30.5		10	SG	37.6	
4	SG	26.3		10	SG	19.1	
4	SG	10.9					
4	RM	21.7					
5	WH	36.4					
5	LO	22.3					
5	RM	34.7					
6	LO	55.6					
6	CP	22.1					
7	E	14.6					
7	RM	42.2					
7	E	16.8					
7	RM	60.3					
7	RM	49.6					
7	E	21.3					
7	CA	11.0					
7	CA	22.4					

JG 9 4 81 1 4 HH 26.0 29.9

1	B	10.0	
1	B	11.1	
1	B	28.2	
1	B	15.4	
1	B	16.7	
1	B	14.3	
1	B	13.0	
1	B	19.7	*
1	CP	27.2	
2	B	9.6	
2	B	16.2	
2	CP	23.5	
2	CP	22.1	
2	B	10.5	
2	B	11.0	
2	B	23.2	
3	CP	32.0	
3	CP	28.1	
3	CP	26.6	
3	CP	29.6	
3	B	11.9	
3	B	8.8	
3	CP	31.8	
4	CP	27.8	
4	CP	32.4	
4	B	12.9	
4	B	19.8	
4	CP	26.5	
4	CP	28.0	
4	LO	24.8	
4	B	8.2	
4	WH	19.1	
4	LO	9.5	
4	B	11.6	
4	B	14.5	
5	SG	11.3	
5	B	13.4	
5	B	7.2	
5	CP	33.2	
5	LO	53.5	
5	CP	25.5	
5	CP	26.9	
5	CP	23.6	
5	LO	32.6	
5	CP	28.0	
5	LO	27.7	
5	LO	37.7	
6	CP	31.2	
6	B	13.5	
6	CP	21.5	
6	SG	46.4	
6	BC	16.5	
6	CP	23.6	
7	CP	28.3	
7	CP	25.5	
7	SG	27.2	
7	B	13.4	
7	CP	29.6	
7	CP	25.3	
7	CP	29.2	
7	WH	53.3	
7	B	7.1	
7	LO	12.1	
7	BG	16.1	
8	BG	19.0	
8	BC	17.2	
9	RM	16.7	
9	SG	13.7	
9	CP	25.1	
9	B	9.5	
9	SG	13.7	
9	BC	17.9	
9	SG	28.0	
9	E	17.8	
9	LO	17.8	
9	BG	14.4	
9	BG	23.9	
9	WH	63.9	
10	LO	14.7	
10	SG	12.3	
10	RM	29.0	
10	LO	15.0	
10	RM	45.0	
10	SG	29.0	
10	CP	25.0	

JG 7 4 81 1 7 FF 30.0 34.9

1	SP	29.5	
1	SP	28.1	
1	SP	21.5	
2	CP	39.4	
2	SP	22.2	
2	SP	20.1	
2	SP	22.5	*
3	SP	17.4	
3	SP	25.3	
3	SP	22.8	
3	SP	20.7	
3	SP	22.7	
4	SP	20.5	
4	SP	16.5	
5	SP	18.8	

JG 7 4 81 1 8 FF 30.0 34.9

1	SP	18.4	
1	SP	24.1	
1	SP	23.7	
1	SP	16.0	
2	SP	10.0	
2	SP	30.0	
3	SP	22.0	
3	SP	18.0	
3	SP	21.5	
4	SP	16.8	
5	SP	27.2	
5	SP	11.5	*
5	SP	13.5	
5	SP	29.2	

JG 10 4 81 2 11 CS 30.0 34.9

1	PC	22.0	*
1	PC	41.1	
1	PC	33.4	
2	PC	19.9	
2	PC	26.1	
3	PC	35.0	
3	PC	21.3	
3	PC	31.6	
3	PC	23.6	
4	PC	13.4	
4	PC	29.2	
4	PC	8.5	
5	PC	22.1	
5	PC	26.8	

JG 10 4 81 2 12 CS 30.0 34.9

1	PC	21.3	*
1	PC	27.3	
1	PC	15.7	
1	PC	25.5	
1	PC	33.2	
1	PC	13.8	
1	PC	27.6	
2	PC	21.0	
2	BG	33.0	
2	PC	12.4	
2	PC	18.0	
2	PC	11.3	
2	PC	25.8	
3	PC	31.2	
3	PC	22.3	
3	PC	16.3	
3	PC	13.3	
3	PC	31.2	
3	PC	26.2	
4	PC	17.9	
4	PC	25.8	
4	PC	22.3	
4	PC	15.2	
5	PC	13.1	
5	PC	12.9	
5	PC	34.1	
5	PC	19.1	
5	PC	21.5	
5	PC	31.3	

JG 27 4 81 2 17 MH 23.0 25.9

1	CP	30.6	
1	LO	20.6	
2	QV	51.8	
2	CP	42.4	
2	CP	40.3	
2	QV	44.0	
3	WO	10.8	
3	QV	40.1	
4	QV	31.4	
4	QV	50.1	
4	CP	35.2	
5	QV	22.0	
5	LO	22.5	
7	SP	17.8	
7	QV	23.5	
7	QV	26.8	
7	QV	15.8	
7	LO	17.4	
10	CP	41.2	*

JG 27 4 81 2 18 MH 23.0 25.9

1	CP	32.7	
1	CP	38.3	
2	QV	51.6	*
3	QV	28.2	
3	CP	31.0	
5	CP	36.7	
6	CP	27.6	
6	CP	32.4	
6	CP	22.8	
7	SQV	12.7	
7	CP	30.2	
9	E	8.0	

JG 29 4 81 2 19 CS 23.0 25.9

1	CA	22.5	
1	CA	9.5	
1	BC	21.6	
1	BC	30.5	*
1	BC	39.8	
2	BC	30.1	
2	BC	30.5	
2	BG	24.5	
2	BC	20.7	
3	BC	26.3	
3	BC	36.6	
3	BC	24.2	
5	BC	19.0	
5	BC	28.4	

JG 29 4 81 2 20 CS 23.0 25.9

1	BC	23.4	
1	BC	23.7	
1	BG	30.9	
1	BC	25.9	
2	BC	18.6	
2	BC	14.4	
2	BC	8.5	
2	BC	19.6	
2	BC	30.0	
2	BC	12.7	
2	BC	14.2	
3	BC	12.2	
3	BC	23.1	
4	BC	25.7	
4	BC	36.0	
4	BC	26.8	
4	BC	16.5	
4	BC	20.6	
5	BC	16.7	*
5	BC	34.8	
5	BC	27.2	

JG 30 4 81 2 21 HS 23.0 25.9

1	CA	18.3	3	CA	7.3	5	RM	18.8		7	CA	7.5
1	CA	18.7	3	CA	22.0	5	CA	10.6		7	CA	15.5
1	CA	7.7	3	BC	45.5	5	CA	10.9		7	CA	7.8
1	CA	7.9	3	CA	28.1	5	CA	15.7		7	CA	9.2
1	CA	9.2	3	CA	18.8	5	CA	11.9		7	CA	10.5
1	CA	23.2	3	CA	7.1	5	CA	8.9		7	CA	12.8
1	CA	31.0	3	CA	7.1	5	BG	54.2		7	DH	5.2
1	CA	14.2	3	RM	31.9	5	CP	29.0		7	CA	8.2
1	CA	8.7	3	CA	13.3	5	CA	7.1		7	RM	39.1
1	CA	9.8	3	CA	15.7	5	CA	17.0		7	BC	12.4
1	CA	9.9	3	CA	8.1	5	CA	9.0	
1	CA	16.0	3	CA	8.0	6	DH	12.3	
1	CA	19.1	3	RM	36.8	6	DH	5.7	
1	CA	18.5	3	CA	8.7	6	E	20.9	
1	CA	24.0	4	CA	14.5	6	E	23.0	
1	CA	11.1	4	BC	46.5	6	RM	31.8	
1	CA	23.9	4	CA	11.5	6	CA	13.2	
1	CA	9.2	4	CA	10.2	6	RM	15.8	
1	CA	12.9	4	CA	17.5	6	RM	40.8	
1	RM	9.9	4	CA	9.6	6	BC	7.0	
2	CA	10.1	4	BG	7.9	6	CA	9.6	
2	CA	11.2	4	RM	31.1	6	CA	13.3	
2	CA	8.8	4	BG	6.9	6	RM	40.0	
2	CA	13.1	4	CA	5.8	7	CA	23.5	
2	RM	28.8	4	CA	20.5	7	CA	25.0	
2	DH	12.6	4	CA	8.1	7	BC	12.6	*
2	BG	59.6	4	CA	21.8	7	BC	40.2	
2	LO	9.5	5	CA	6.5	7	BC	28.0	
2	CA	33.7	5	CA	9.1	7	LO	20.5	
2	CA	15.6	5	CA	10.2	7	CA	19.1	
2	CA	9.5	5	CA	8.4	7	CA	12.9	
2	RM	16.2	5	CA	6.2	7	CA	16.0	
2	E	9.1	5	CA	10.9	7	CA	26.1	
2	CA	30.2	5	CA	14.8	7	CA	24.5	
2	RM	16.3	5	E	16.8	7	CA	18.6	
2	LO	39.3	5	RM	31.6	7	CA	19.3	

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1	CA	12.7	2	CA	12.1	3	BC	8.5	5	E	12.2	6	CA	7.1
1	CA	7.5	3	CA	12.5	3	LO	21.5	5	CA	7.7	6	CA	25.2
1	CA	9.1	3	CA	10.2	4	CA	15.8	5	CA	14.5	6	CA	24.0
1	CA	14.1	3	CA	18.1	4	CA	24.9	5	CA	7.5	7	CA	9.3
1	CA	8.9	3	CA	8.4	4	CA	7.5	5	CA	11.0	7	CA	8.1
1	BC	18.1	3	CA	18.1	4	CA	8.9	5	CA	8.0	7	CA	11.2
1	CA	9.7	3	CA	7.6	4	CA	28.7	5	CA	10.4	7	CA	7.0
1	CA	13.7	3	CA	9.4	4	CA	16.9	5	CA	9.0	7	WL	38.8
1	CA	15.2	3	CA	18.1	4	CA	19.4	5	CA	22.3	7	CA	7.1
1	CA	13.2	3	CA	4.9	4	CA	23.2	5	CA	7.8	7	CA	15.2
1	CA	8.2	3	CA	8.5	4	CA	13.1	5	CA	6.4	7	CA	11.4
1	CA	15.1	3	CA	13.8	4	CA	9.0	5	CA	9.3	7	CA	14.7
1	CA	10.7	3	CA	14.4	4	CA	14.6	5	CA	20.3	7	CA	20.8
1	CA	7.7	3	CA	25.4	4	CA	11.6	5	CA	11.6	7	CA	10.9
2	CA	10.5	3	CA	4.9	4	CA	10.7	5	CA	12.5	7	CA	10.8
2	CA	11.9	3	CA	20.0	4	CA	19.5	5	CA	8.0	7	CA	27.6
2	CA	8.5	3	CA	6.9	4	CA	19.6	5	CA	14.7	7	CA	26.6
2	CA	5.0	3	CA	7.0	4	CA	15.8	5	CA	8.6	7	CA	9.5
2	CA	11.5	3	CA	10.3	4	CA	10.3	5	CA	15.7	7	RM	9.3
2	CA	15.2	3	CA	9.6	4	CA	9.4	5	CA	25.5	7	CA	7.2
2	CA	6.8	3	CA	8.5	4	CA	23.1	5	CA	11.8	7	RM	8.1
2	BC	36.9	3	CA	9.0	4	CA	9.1	6	CA	8.1	7	LO	16.5
2	BC	46.5	3	CA	6.6	4	CA	7.0	6	BG	49.7	7	CA	7.4
2	DH	8.0	3	CA	9.6	4	CA	14.2	6	RM	21.7	7	CA	12.0
2	DH	6.8	3	CA	13.0	4	CA	8.3	6	RM	31.4	7	CA	9.5
2	CA	17.0	3	RM	19.3	4	CA	22.0	6	RM	26.3	7	CA	12.9
2	CA	13.6	3	RM	18.3	4	CA	9.6	6	E	11.9	7	CA	7.7
2	CA	16.1	3	WL	31.3	4	CA	11.2	6	E	7.2	7	CA	7.2
2	CA	17.5	3	CA	7.4	4	E	15.8	6	E	9.1	7	CA	8.3
2	CA	26.5	3	CA	12.6	4	CA	29.3	6	LO	12.5	7	CA	8.9
2	CA	11.7	3	CA	11.1	4	CA	13.0	6	E	20.5	7	CA	9.0
2	CA	14.3	3	CA	13.7	4	CA	46.5	6	RM	6.3	7	CA	8.5
2	CA	12.9	3	CA	10.0	4	CA	12.7	6	CA	9.3	7	CA	11.9 *
2	CA	6.3	3	CA	7.2	4	CA	28.0	6	CA	17.5	7	CA	16.5
2	RM	8.3	3	CA	13.2	4	RM	12.0	6	CA	7.2	7	CA	9.5
2	CA	20.1	3	CA	10.3	4	CA	7.7	6	CA	10.7			

JG 30 4 81 2 23 HH 23.0 25.9

1	LO	15.0	
1	E	15.4	
1	E	7.3	
1	LO	47.4	
1	LO	26.5	
1	SD	5.1	
1	BG	10.5	
1	E	9.7	
1	RM	15.6	
2	LO	33.3	*
2	E	11.8	
2	LO	15.4	
2	E	10.5	
2	CP	35.8	
2	RM	9.5	
2	RM	7.7	
2	RM	25.3	
3	LO	23.4	
3	RM	18.4	
3	CP	40.2	
3	E	6.7	
3	E	7.8	
3	RM	32.0	
3	RM	15.5	
3	E	12.2	
3	E	10.1	
4	DH	10.2	
4	LO	18.2	
4	BG	9.2	
4	RM	15.8	
4	RM	16.7	
4	RM	26.0	
4	RM	11.0	
4	E	7.9	
4	RM	14.0	
5	E	13.0	
5	LO	37.6	
5	CA	13.8	
5	E	7.3	
5	CA	13.6	
5	RM	20.5	
5	LO	12.0	
5	LO	10.1	
5	LO	11.1	
6	LO	27.8	
6	LO	11.2	
6	LO	18.8	
6	CP	35.0	
6	RM	30.5	
6	CA	6.2	
6	LO	22.1	
6	LO	17.4	
6	LO	23.8	
7	LO	8.8	
7	LO	14.1	
7	LO	7.2	
7	LO	18.4	
7	BC	8.4	
7	CP	34.0	
7	LO	16.8	
7	LO	60.8	
7	RM	9.8	
7	LO	55.1	
8	CA	12.6	
8	RM	9.9	
8	E	15.2	
8	CA	14.1	
8	LO	9.0	
8	BG	12.5	
8	CA	6.2	
8	LO	12.2	
8	CP	35.6	
9	BC	11.5	
9	E	36.2	
9	E	12.7	
9	LO	15.4	
9	RM	45.8	
9	RM	30.4	
9	LO	9.1	
9	DH	12.1	
10	E	9.3	
10	E	16.9	
10	E	10.6	
10	RM	30.1	
10	LO	25.3	
10	LO	14.1	

JG 29 4 81 2 24 HH 23.0 25.9

1	RM	34.8	*
1	E	8.9	
1	E	23.8	
1	E	11.2	
1	RM	31.9	
1	DH	11.3	
1	E	7.5	
1	LO	6.9	
1	RM	11.5	
1	CP	25.6	
2	BC	5.5	
2	LO	18.9	
2	RM	25.2	
2	CP	25.9	
2	CP	28.6	
3	DH	10.1	
3	LO	6.5	
3	E	32.0	
3	LO	39.0	
3	CP	26.0	
3	RM	21.4	
3	CP	28.3	
3	E	13.5	
3	CP	27.4	
4	CA	8.5	
4	E	6.7	
4	CP	29.7	
4	CP	28.0	
4	E	18.4	
4	E	16.0	
4	RM	17.8	
4	E	13.3	
4	CP	33.4	
4	RM	17.2	
4	RM	29.7	
5	CA	20.2	
5	BG	5.9	
5	BC	21.5	
5	RM	43.7	
5	RM	9.6	
6	RM	45.3	
6	CP	25.2	
6	LO	14.5	
7	CP	24.7	
7	E	13.6	
7	BC	8.8	
7	CP	27.7	
7	CP	26.4	
7	CP	25.5	
7	E	7.2	
7	RM	14.0	
8	BC	6.1	
8	CP	22.9	
8	CP	25.5	
8	CP	28.8	
8	RM	20.9	
8	RM	21.4	
9	CP	29.7	
9	E	22.3	
9	CP	26.5	
9	LO	51.4	
9	E	25.9	
9	RM	30.5	
9	RM	7.4	
9	CP	19.9	
9	CP	25.2	
9	CP	30.0	
9	LO	19.1	
9	LO	12.8	
9	E	18.3	
9	LO	31.8	
10	CA	14.2	
10	CP	29.0	
10	CP	23.6	
10	RM	8.0	
10	RM	47.5	
10	CP	27.3	
10	CP	26.9	
10	E	8.1	

JG 8 4 81 3 27 HS 23.0 25.9

1	CA	19.4	
1	CA	19.9	
1	CA	26.8	
1	CA	18.8	
1	CA	22.8	
1	BG	46.1	
1	BG	34.7	
1	CA	11.5	
1	LO	11.6	
1	BC	52.8	
2	BC	53.2	
2	RM	13.6	
2	RM	22.2	
2	RM	22.8	
2	CA	12.5	
2	E	20.1	
2	RM	12.0	
3	RM	29.9	
3	CA	20.9	
3	CA	17.8	
3	LO	13.0	
3	BC	53.2	
3	CA	11.5	
3	CA	11.8	
3	CA	12.5	
3	CA	10.5	
3	RM	16.1	
3	E	17.4	
3	BG	24.9	
4	CA	14.1	
4	RM	22.2	
5	RM	38.2	
5	CA	18.2	
5	CA	13.3	
5	CA	26.9	
5	CA	32.2	
6	RM	10.6	
6	CA	15.0	
6	CA	12.8	
6	E	10.3	
6	CA	20.6	
6	CA	11.0	
6	CA	10.3	
6	CA	13.0	
6	CA	10.8	
6	CA	20.6	
6	CA	26.1	
6	RM	11.8	
6	RM	50.4	
7	CA	14.0	*
7	CA	22.2	
7	BC	47.4	
7	E	37.1	
7	BC	10.7	
7	RM	37.1	
7	LO	43.5	
7	CA	14.4	
7	CA	15.0	
7	CA	11.2	
7	CA	10.5	

JG 8 4 81 3 28 HS 23.0 25.9

1	CA	15.1
1	RM	32.7
1	E	10.0
1	CA	21.1
1	CA	14.0
1	CA	30.2
1	CA	15.3
1	BC	32.0
2	CA	13.1
2	CA	17.0
2	CA	10.9
2	CA	12.2
2	E	39.5
2	CA	11.1
2	CA	21.0
2	RM	15.7
2	BC	13.3
2	E	22.4
3	CA	29.2
3	CA	21.3
2	CA	9.9
2	RM	38.0
3	RM	34.6
3	CA	14.1
3	BC	17.2
3	BG	25.2
3	BC	44.0
3	CA	18.7
3	CA	21.0
3	CA	16.8
3	CA	17.4
3	CA	15.6
3	BC	41.1
3	CA	9.5
4	BC	48.0
4	CA	9.9
4	LO	27.1
4	CA	11.9
4	CA	26.6
4	CA	10.5
4	BC	26.5
5	CA	16.9
5	CA	10.6
5	E	16.0
5	BC	11.2
5	BC	33.5
5	BC	35.2
5	CA	22.4
5	CA	21.5
5	CA	12.5
5	CA	15.9
5	RM	32.8
5	RM	35.8
6	CA	21.6
6	E	11.8
6	CA	33.7
6	CA	18.2
6	RM	33.2
6	CA	23.5
6	CA	11.2
6	LO	17.4
7	CP	27.2
7	CA	22.7
7	CA	14.1
7	CA	11.6
7	CA	11.4
7	CA	15.0
7	RM	20.0
7	CA	20.8
7	CA	22.6
7	RM	42.6
7	E	13.9
7	CA	20.5
7	CA	11.3
7	CA	13.9
7	CA	18.3

JG 8 4 81 3 29 HH 23.0 25.9

1	RM	36.6
1	RM	21.2
1	RM	13.6
1	RM	28.9
1	CP	33.5
1	CA	14.5
1	E	10.8
1	E	9.3
1	E	25.2
1	CP	17.7
1	BC	11.1
1	BC	13.5
1	BG	11.3
1	CA	10.1
1	CP	27.2
2	E	13.5
2	CP	25.3
2	CA	14.2
2	CP	24.5
2	BC	35.6
2	CA	12.8
2	BC	15.5
2	BC	20.2
2	BC	16.0
3	RM	72.6
3	RM	21.4
3	E	14.2
3	CP	31.0
3	RM	38.5
3	E	35.9
4	E	19.6
4	CP	31.5
4	BC	14.0
4	RM	16.5
4	E	22.3
4	BC	21.8
4	CP	30.6
5	CP	34.0
5	CP	25.5
5	CP	31.0
5	CP	30.1
5	RM	15.9
5	BC	11.0
5	LO	26.7
6	LO	77.4
6	CP	29.3
6	E	11.6
6	LO	17.0
6	E	15.8
6	CP	27.5
6	RM	17.6
6	CP	23.1
6	BC	16.6
7	LO	16.6
7	CP	30.8
7	RM	17.9
8	E	18.5
8	CP	27.6
8	CP	27.6
8	CP	42.0
8	CP	29.5
8	LO	29.3
8	BC	14.8
8	BC	17.6
8	CP	25.9
8	LO	25.8
8	LO	22.1
8	RM	17.6
9	CP	26.2
9	E	12.2
9	E	14.4
9	LO	10.7
9	E	14.0
9	CP	27.3
9	CP	31.7
10	CP	23.5
10	E	11.3
10	CP	33.6
10	CP	25.3
10	CP	25.6
10	CP	32.6
10	LO	40.7
10	CP	30.5
10	LO	19.4 *

JG 8 4 81 3 30 HH 23.0 25.9

1	E	15.1	6	LO	34.0
1	CP	26.8	6	LO	19.1
1	CP	27.5	6	LO	20.9
1	CP	29.4	6	LO	24.1
1	CP	25.3	6	CP	25.8
1	LO	23.7	7	CP	33.3
1	WH	29.7	7	CP	26.8
2	CP	29.8	7	SP	25.7
2	CP	32.0	7	CP	20.1
2	CP	32.7	7	CP	28.7
2	CP	22.2	7	CP	29.5
2	CP	30.3	7	CP	23.5
3	CP	28.2	8	CP	24.3
3	RM	26.2	8	CP	29.8
3	RM	27.0	8	CP	30.4
4	CP	31.9	8	CP	24.0
4	LO	24.4	8	CP	31.8
4	LO	14.0	8	CP	19.9
4	BC	16.2	8	CP	28.8
4	CP	32.6	8	CP	23.8
4	CP	23.5	8	CP	29.6
4	LO	29.5	9	CP	24.9
4	CP	28.2	9	CP	26.4
4	CP	28.8	9	CP	33.0
4	E	29.2	9	LO	20.6
5	LO	20.8	10	CP	32.0
5	CP	34.0	10	CP	28.0
5	CP	37.8	10	CP	24.7
5	BC	21.0	10	CP	28.7
6	CP	40.5	10	CP	30.0
6	CP	23.0	10	CP	23.5
6	CP	28.2	10	LO	30.1
6	CP	23.0	10	LO	15.6 *
6	CP	26.1			

JG 23 7 81 3 37 MH 26.0 29.9

1	CP	27.6
1	CP	24.5
1	LO	16.7
1	LO	12.4
1	LO	18.0
1	CP	20.8
1	LO	11.6
1	LO	14.8
1	LO	10.5
1	CP	25.1
1	LO	9.0
1	LO	14.8
2	LO	12.0
2	LO	11.4
2	LO	12.1
2	LO	9.6
2	LO	8.7
2	LO	9.6
2	LO	13.4
2	CP	21.0
2	CP	30.8
2	LO	6.7
2	LO	7.1
2	CP	27.9
2	LO	10.1
2	LO	13.7
2	LO	9.1
2	LO	8.3
2	LO	9.5
2	DO	5.0
2	DO	7.7
2	LO	12.3
2	LO	9.8
2	LO	5.6
2	LO	5.3
2	LO	14.0
2	LO	7.8
2	LO	9.0
2	LO	6.2
3	CP	26.1
3	LO	18.8
3	LO	14.7
3	LO	15.6
3	CP	24.8
4	CP	26.2
4	CP	28.8
4	CP	30.6
4	CP	25.6
4	CP	19.3
4	CP	26.8
4	LO	16.5
4	LO	21.0
4	LO	10.9
4	LO	10.0
4	LO	9.1
4	LO	18.1
4	LO	7.6
5	LO	25.7
6	CP	42.6
6	CP	34.5
6	DO	10.9
6	CP	29.2
6	CP	29.0
7	CP	26.9
7	CP	23.3
7	CP	30.7
7	CP	20.6
8	CP	33.3
8	CP	37.4
8	CP	34.1
8	CP	33.0
8	CP	34.2
8	CP	28.1
8	CP	29.8
9	CP	30.0
9	CP	41.6
9	CP	32.3
9	CP	34.2
9	CP	27.9
9	CP	28.0
10	CP	32.7
10	CP	26.7

JG 23 7 81 3 38 MH 26.0 29.9

1	CP	22.0
1	CP	48.5
1	LO	17.5
1	CP	27.0
1	LO	21.1
1	CP	29.1
1	CP	29.9
1	LO	16.3
1	CP	23.4
1	CP	29.2
1	LO	7.6
1	LO	9.6
1	LO	18.4
1	LO	11.9
1	LO	7.5
1	LO	16.0
1	CP	34.4
2	CP	23.3
2	CP	25.3
2	LO	11.6
2	CP	28.5
2	LO	10.9
2	CP	28.1
2	CP	29.8
2	CP	30.0
2	LO	11.2
2	LO	7.5
2	LO	7.4
2	CP	25.6
2	CP	31.3
2	CP	26.1
3	CP	28.9
3	CP	34.2
3	LO	14.5
3	LO	9.0
3	CP	25.5
3	CP	25.1
3	LO	10.3
3	LO	21.3
3	CP	28.0
3	CP	28.9
4	LO	8.5
4	LO	10.6
4	LO	16.1
4	CP	27.0
4	CP	22.3
4	LO	20.8
4	CP	27.7
4	CP	26.1
4	CP	30.8
4	LO	30.5
4	SP	33.7
4	LO	11.7
4	CP	28.0
4	CP	45.7
4	LO	12.3
4	LO	11.5
4	LO	12.2
4	LO	9.8
5	CP	29.1
5	CP	28.0
5	LO	13.2
5	LO	23.3
5	LO	17.0
6	LO	9.1
6	LO	12.1
6	LO	12.0
6	LO	9.7
6	CP	32.4
6	LO	18.0
6	LO	9.9
6	LO	21.8
6	CP	23.0
6	CP	24.5
6	LO	9.3
6	LO	11.5
6	LO	11.6
6	LO	15.7
6	LO	16.8
7	CP	23.3
7	CP	27.4
7	CP	28.6
7	CP	24.1
7	CP	27.3
7	CP	34.8
7	CP	27.1
8	CP	25.3
8	CP	20.7
8	CP	28.4
8	CP	31.0
8	CP	30.2
8	CP	34.0
8	CP	43.0
9	CP	31.2
9	LO	35.7
9	SP	16.9
9	LO	10.8
9	CP	29.2
9	CP	27.8
9	CP	42.0
10	DO	27.6
10	CP	25.9
10	DO	11.9
10	DO	13.0
10	DO	13.7
10	DO	16.8
10	DO	10.9
10	CP	33.2

JG 29 4 81 4 31 HS 30.0 34.9

1	BG	21.7	
1	BC	89.1	
1	CA	18.0	
1	RM	11.1	
2	BC	27.6	
2	CA	18.6	
2	CA	18.2	
2	BC	37.2	
2	RM	29.0	
2	RM	13.3	
2	CA	24.9	
2	RM	19.9	
2	RM	30.2	
3	E	14.1	
3	E	11.1	
3	CA	19.0	
3	CA	10.6	
3	CA	12.0	
3	CA	20.5	
3	CA	17.9	
3	BC	12.3	
3	BC	32.6	
3	CA	24.4	
3	BC	37.0	
3	BC	20.3	
4	BC	20.3	
4	RM	7.6	
4	CA	23.8	
4	CA	25.6	
4	CA	15.9	
4	CA	20.8	
4	BC	23.5	
4	RM	34.5	
4	BC	47.5	
4	RM	11.6	
4	BC	28.1	
4	BC	33.1	
5	BC	33.5	
5	BC	42.2	
5	BC	10.5	
5	BC	36.6	
5	BC	26.2	
6	BG	16.1	
6	CA	16.1	
6	CA	14.8	
6	E	10.5	
6	BC	40.1	
6	RM	21.3	
6	BC	41.3	
6	BC	41.6	
6	CA	10.3	
6	CA	15.7	
6	CA	11.1	
6	E	7.8	
6	CA	10.0	
6	RM	71.0	
7	BG	20.4	
7	CA	14.4	
7	RM	37.1	
7	BC	14.5	*
7	CA	7.3	
7	CA	18.4	
7	BG	35.2	
7	CA	22.7	
7	BC	27.0	
7	BC	20.8	
7	BC	18.2	
7	CA	8.6	
7	CA	10.9	
7	BC	45.6	

JG 29 4 81 4 32 HS 30.0 34.9

1	BC	12.8		4	E	15.6		6	BC	7.0
1	CA	8.4		4	CA	18.6		7	BC	20.1
1	RM	51.4		4	CA	15.0		7	CA	20.7
1	CA	16.5		4	CA	18.5		7	RM	7.8
1	RM	51.6		4	BC	16.4		7	BC	15.8
1	BC	15.2		4	CA	15.2		7	BC	23.2
1	CA	18.9		4	BC	11.7		7	BG	18.5
1	BC	17.6		5	CA	11.5		7	BG	22.7
1	CA	20.7		5	CA	12.3		7	BC	14.0
1	BC	26.4		5	E	8.2		7	RM	31.0
1	CA	16.4	*	5	BC	19.2		7	CA	9.6
2	CA	11.7		5	CA	11.8		7	BG	31.3
2	BC	6.6		5	BC	18.1		7	CA	15.0
2	CA	11.3		5	RM	12.1		7	CA	10.1
2	RM	37.5		5	BC	21.0		7	BC	7.3
2	CA	15.3		5	BC	7.1		7	CA	14.0
2	CA	14.3		5	RM	39.4		7	CA	10.0
2	BC	16.3		5	RM	33.6		7	CA	11.0
2	CA	11.5		5	CA	12.8		7	BC	22.9
2	CA	18.0		5	CA	18.0		7	BC	21.9
2	CA	19.6		5	BG	9.6		7	CA	14.1
3	CA	12.0		5	BG	6.6				
3	E	14.1		6	CA	15.6				
3	CA	10.0		6	BC	14.7				
3	RM	45.7		6	RM	37.4				
3	CA	17.4		6	RM	13.6				
3	RM	15.8		6	CA	20.6				
3	CA	19.9		6	CA	22.5				
3	CA	22.1		6	RM	13.2				
3	BC	12.0		6	CA	11.8				
4	CA	8.7		6	BC	14.0				
4	RM	27.2		6	BG	7.8				
4	RM	19.7		6	CA	8.4				
4	RM	53.5		6	CA	9.5				
4	BG	14.0		6	CA	12.7				
4	RM	21.3		6	CA	25.1				