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## Vascular Flora of Mathews County, Virginia

Margaret Norman van Montfrans  
*College of William & Mary - Arts & Sciences*

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VASCULAR FLORA OF MATHEWS COUNTY,  
VIRGINIA

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A Thesis

Presented to

The Faculty of the Department of Biology  
The College of William and Mary in Virginia

In Partial Fulfillment

Of the Requirements for the Degree of  
Master of Arts

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by

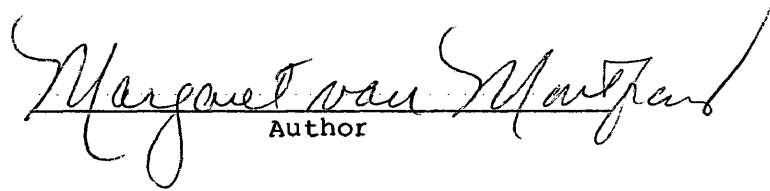
Margaret N. van Montfrans

1980

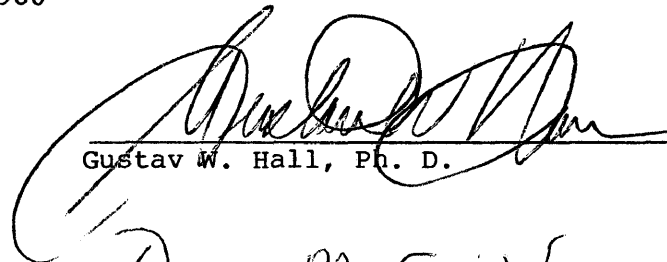
APPROVAL SHEET

This thesis is submitted in partial fulfillment of  
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Author

Approved, May 1980



Gustav W. Hall, Ph. D.

  
Donna M. E. Ware, Ph. D.

  
Mitchell A. Byrd, Ph. D.


  
Gregory M. Capelli, Ph. D.

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## ABSTRACT

Collections of the vascular flora of Mathews County in the Virginia Coastal Plain were made from June of 1978 through November 1979. The study area covers approximately 105 square miles in the easternmost section of the Middle Peninsula. Some of the habitats investigated include salt marshes, fresh-water marshes and swamps, mixed pine-deciduous woods, and disturbed areas. A total of 640 species of plants was identified, 467 of which were records for Mathews County. Some noteworthy species found include Carya aquatica, a species near its northernmost limit in Mathews County; Salpichroa organifolia, previously reported from only three other locations in the state; and Lechea maritima var. virginica, a species listed as possibly endangered by the Department of Interior.

In addition, a vegetational analysis to determine species dominance was made at two sites in the county. The dominant tree at the site sampled on bluffs overlooking the Piankatank River was Quercus prinus, with Q. velutina, Liquidambar styraciflua, Quercus alba, and Liriodendron tulipifera next in order of decreasing importance. At the North End Branch swamp site, dominant species included Acer rubrum and Liquidambar styraciflua, followed by Carpinus caroliniana, Carya aquatica, and Liriodendron tulipifera.



VASCULAR FLORA OF MATHEWS COUNTY, VIRGINIA

## INTRODUCTION

Mathews County covers an area of 105 square miles and constitutes the easternmost portion of the Middle Peninsula of Virginia, that tongue of land between the Rappahannock and the York Rivers. The other counties which make up the Middle Peninsula are Gloucester, Middlesex, Essex, King and Queen, and King William. On a map of Virginia, Mathews County can easily be differentiated as it juts out southeastward into the Chesapeake Bay. It is bounded on the north by the Piankatank River, on the west by the North River marking the boundary with Gloucester County, and to the south and east by Mobjack Bay and the Chesapeake Bay, respectively. Elevation within the county is remarkably and uniformly low, with the great majority of the land mass being 10 feet or less above sea level, and relatively large areas of salt marsh being regularly inundated through tidal action. The county is threaded and divided irregularly by numerous tidal creeks and rivers, interspersed with low-lying fingers of land. In this sense, Mathews County can be considered as representative of the most extreme of the characteristic Coastal Plain configuration, for it lacks many transitional areas reminiscent of the relief profiles seen in a borderline Piedmont - Coastal Plain area.

Mathews County was chosen as the site of this study since floristic knowledge of the area was quite deficient, with only a few collections by Harvill (1966), Marsh (1969), and Ted Bradley (George Mason University) on record. In fact, the flora of the Middle Peninsula has been regarded as one of the "least known of all the regions of the eastern states" (Harvill, 1966). Since two other counties of the Middle Peninsula have recently been the subjects of floristic investigations (Gloucester County by Greaves, unpublished manuscript, and Middlesex County - Dragon Run by Train, 1978), it was felt that this project would complement previous work. It will also aid in completing the county-by-county inventory of vascular plants for the state which has been the cooperative effort of Virginia botanists for several years.

It was believed that records from Mathews County would be of interest phytogeographically, since many species from the southern states have their apparent northernmost limit on the Middle Peninsula of Virginia (Harvill, 1966). Information on which species are present in Mathews, but appear to "drop out" in areas farther north, as seen on a distributional map, could be important in understanding the overall pattern of plant distribution along the East Coast.

In addition to the floristic portion of the study, a vegetational analysis of species dominance at two sites within the county was performed. Most of the forested areas in Mathews County consist of second-growth mixed pine and deciduous woodlands, but two stands which were atypical of the county as a whole were chosen for structural analysis. One site was a lowland woods associated with the floodplain of

a branch of the North River. Preliminary collecting in this area had revealed numerous Water Hickories (Carya aquatica), a species of the southeastern Coastal Plain, apparently near the northernmost limit of their range. Quantitative sampling in this area was undertaken to determine the relative structural importance of C. aquatica in this vegetational association. The other site selected for sampling was an upland woods occurring along steep bluffs overlooking the Piankatank River, in the extreme northwest corner of the county. This location represents a unique habitat, since elevation reaches as much as 30 feet above mean sea level, which is considerably higher than most of the rest of the county. Many species encountered here did not occur elsewhere, so information concerning the structure of the vegetation in this area seemed especially desirable. This was particularly true since the spot is slated for development, and it is not known what impact this may have on the vegetation in the future.

## HISTORY

Originally a part of Gloucester County, the county known as Mathews was not established as such until 1790. Prior to the Civil War, most of the low-lying, wetter sections of the interior of the county were drained by a series of dikes and ditches and used for farming. However, many of the ditches later became clogged, and some of the cleared land was abandoned, after which it passed through several successional stages of growth (Soil Survey, USDA, 1962). Some of these areas are now mixed pine-hardwood forests, while others are once again being cleared for cultivation. Mathews County, predominantly rural, is presently a mosaic of small farms. Corn, soybeans, truck vegetables, grains and daffodils are important crops. The seafood industry is another primary source of income for the county, which boasts a waterfront of more than 150 miles (Soil Survey, USDA, 1962).

The area is rich in historical precedents of a botanical nature, since it is believed that the home of John Clayton, prominent field botanist of the 1700's, was near the present day town of Soles, in Mathews County. Clayton was made clerk of the Gloucester County Court in 1720, a post which he held for fifty-three years. Although he had studied law, he became very interested in botany at an early stage in his

career, and collected numerous hitherto undescribed plants throughout the Middle Peninsula of Virginia and while traveling in other areas of the state. Many of his collections were sent to Dr. J. F. Gronovius for identification, who in turn sought the aid of his eminent contemporary, Carolus Linnaeus. Clayton prepared a manuscript to catalogue the plants native to Virginia based on his extensive field work, which Gronovius published as the Flora Virginica in 1739 (Berkeley and Berkeley, 1963). Linnaeus relied heavily on this volume in preparing his Species Plantarum, with the result that probably over 400 Linnaean type species of eastern North America originated from John Clayton's collections (Fernald, 1940). However, these early specimens did not give information regarding specific location, thus explaining the lack of early county records for the area (Massey, 1939). Following Clayton's death in 1733, no botanical investigation of any magnitude was undertaken in the Middle Peninsula until recent studies such as those of Greaves (unpublished manuscript), Train (1979), and the present work.

## GEOLOGY

Three of the terraces typical of outer Coastal Plain formations are found in Mathews County. The Princess Anne Terrace, with elevations of a maximum of 15 feet above sea level, makes up over 80% of the county, stretching from New Point Comfort to Blakes. The Dismal Swamp Terrace, with elevations of 10 - 25 feet, comprises another 10% of the county area, as does the Chowan Terrace, with 30 - 45 feet relief. Nearly all of the county has a slope of less than 2%, with the only well-drained land areas occurring along streams and rivers. The water table is quite high throughout the county (Soil Survey, USDA, 1962).

Parent material for all the soils in Mathews County is unconsolidated marine sediment of gravel, sand, clay, and silt of Pleistocene origin; there is little decayed organic material. Shell marl is generally found below a depth of 40 feet, and has had little influence on the soils of the county. The basement Precambrian granitic rock lies at progressively greater depths proceeding from the Fall Line eastward to the Bay, such that in Mathews, the unconsolidated sediments thicken to more than 2,000 feet (Soil Survey, USDA, 1962).

Soil associations were mapped in detail for the county in 1962, and consist of four major categories: the Sassafras-Kempsville-Sandy Land

Association, the Fallsington Association, the Dragston-Woodstown-Kempsville Association, and the Tidal Marsh-Coastal Beach Association. The Sassafras-Kempsville-Sandy Land Association is found in the northwest corner of the county, between State Route 198 and the Piankatank River. Making up only 6% of the land area in the county, this association is well-drained to excessively drained, very acid, and has a friable, yellowish-brown subsoil over beds of sand. The superior drainage qualities of this soil in comparison with the rest of the county must be a factor in considering why several plant species were found exclusively in this part of the study area.

The Fallsington Association, comprising about 50% of the total land area, is poorly drained with a surface layer of sandy loam and a subsoil of permeable clay and wet sand. It covers all of the county with the exception of the northwest corner, the areas along rivers and creeks, and the tidal marshes.

The soil association which occurs along rivers, Mobjack Bay, and Milford Haven is the Dragston-Woodstown-Kempsville Association. Most of the cultivated land in the county is of this soil association. On low marine terraces, it has a subsoil of fine sandy loam underlain by sand at a depth of about three feet, and makes up approximately 35% of the land area of the county. Its characteristics vary from somewhat poorly drained to well-drained, acid soil, with a water table somewhat lower than the soils of the Fallsington Association.



The last major soil association in the county is the Tidal Marsh-Coastal Beach Association, running along the edge of the Chesapeake Bay, from Gwynn Island to New Point Comfort. This area is, of course, subject to regular flooding by saline tides, and much of the soil material consists of mineral soil of variable texture, mixed with organic matter in various stages of decomposition (Soil Survey, USDA, 1962).

## CLIMATE

The climate of Mathews County is mild, with temperatures being buffered by surrounding bodies of water, as the county extends as a peninsula into the Chesapeake Bay and Mobjack Bay. Temperature and rainfall readings are similar to those described by Train (1978) for Middlesex County, Appler (1974) for the City of Newport News, and Barans (1974) for Williamsburg. The average yearly temperature reported at Bohannon in Mathews County for the period from 1963 to 1977 was 58.4°F, with an average 210.2 day growing season (frost-free period). The last figure is intermediate between the 195 day frost-free period reported for Williamsburg and the 235 day period for Newport News. For Urbanna in Middlesex County, Train reports a mean yearly temperature of 58.2°F, and a frost-free period of 206 days.

During the 15 year period from 1963 to 1977, the annual rainfall in Mathews County varied from a minimum of 35.32 inches to a high of 54.23, with an average value of 44.26 inches, which is very close to that reported for Middlesex County, as well as for Newport News and Williamsburg. Precipitation is generally well distributed throughout the year (Soil Survey, USDA, 1962). Temperatures recorded for 1978 during this study were not substantially different from averages reported over the past 15 years. The growing season, however, was quite long, with 246 days in the frost-free period for 1978, and annual precipitation at 51.14 inches.

Table 1  
 Summary of the Climatological Data Recorded at  
 Bohannon, Mathews Co.\*

	Temperature°F			Annual Precipt. in inches	Last Spring Minimum of 32°F	First Fall Minimum of 32°F	Number of Frost- Free Days
	Mean	High	Low				
1963	56.9			43.63	3/23	11/4	226
1964	58.6	98	15	48.76	4/10	11/22	226
1965	58.4	94	6	35.32	4/5	10/30	208
1966	57.3	95	12	42.32	4/11	10/31	203
1967	57.2	93	13	38.00	4/12	11/6	208
1968	57.9	96	9	42.51	4/7	10/30	206
1969	57.6	96	11	44.27	3/31	10/24	207
1970	58.5	94	4	39.98	4/8	11/18	224
1971	-	94	5	48.75	4/1	11/23	236
1972	58.7	100	3	52.73	4/10	10/21	194
1973	-	102	10	44.81	4/14	11/6	206
1974	59.9	97	18	45.62	4/10	10/4	177
1975	59.9	97	17	54.23	4/14	11/15	215
1976	58.5	98	11	45.23	4/12	10/29	200
1977	59.5	103	0	37.73	4/10	11/23	217
AVER.	58.4			44.26			210.2

\*Adapted from U.S. Department of Commerce, Weather Bureau.  
 Climatological Data (Annual Summaries 1963-1977 for Virginia) Vol. 72-87.

## METHODS

### I. Floristic Analysis

Collections of plant specimens were made at least once a week from June, 1978 through November, 1978 and from April, 1979 through November, 1979. To obtain adequate floristic coverage, several sites representative of each habitat were selected and intensive collecting carried out in these areas, as well as at other localities scattered throughout the county. Topographic maps were consulted in an attempt to find potentially productive areas. Specimens were collected in triplicate whenever possible, were numbered consecutively with the author's collecting number, and noted as to location, habitat, and relative abundance. Relative abundance was specified as rare (one to a few individuals seen at only one site), uncommon (plants seen at a few sites), occasional (seen at several sites), common (seen at many sites), and abundant (plants seen throughout the area).

After plants were pressed and identified, a complete set of voucher specimens was deposited in the Herbarium of the College of William and Mary. Additional sets of specimens are being deposited in the herbaria at Virginia Polytechnic Institute and State University, Lynchburg

College, and University of North Carolina at Chapel Hill. For identification of specimens, keys in the following manuals were consulted: Radford, Ahles and Bell (1968), Gleason (1952), Fernald (1950), and Hitchcock (1935). Nomenclature in the annotated checklist and elsewhere in this study follows that of Radford et al. except where noted. Determination of state and county distributional records was made by consulting the Atlas of Virginia Flora, Part I - Pteridophytes through Monocotyledons (Harvill et al., 1977), Part II - Dicotyledons (Harvill et al., unpublished first draft manuscript), Johnson (1980), and Massey (1961).

## II. Vegetational Analysis

Both forest sites sampled in the vegetational portion of the study were selected on the basis of relative uniformity, predominantly hardwood composition, and sufficient size (a minimum of two acres). Systematic sampling was carried out in each woods in what appeared to be the least disturbed and most homogeneous section. Absolute dominance was measured in square meters per hectare, cross-sectional area breast high, by the Bitterlich method (Beers and Miller, 1964), utilizing a Spiegel Relaskop angle gauge. Six systematically placed samples were taken in the swampwoods, and five in the bluff woods. Measurements of relative dominance were calculated for each species present in the sampled stand so that species could be ranked in order to determine their importance in the community as a whole.

## FLORISTIC ANALYSIS BY HABITAT

Although Mathews County has large areas of land which are either in agricultural use or under development, numerous relatively unspoiled habitats remain, including salt marshes, fresh-water marshes and swamps, lowland mixed pine-deciduous woods, and ravines and bluffs. The eastern and middle portion of the county is heavily dissected by estuarine fingers of the Chesapeake Bay, with extensive reaches of thriving salt marsh and coastal strand plant communities. Many of these areas have largely escaped human disturbance, although particular spots have, unfortunately, been relegated to the ignominious function of garbage heaps. Species commonly seen on dunes and beaches were Panicum virgatum, Ammophila breviligulata, Atriplex patula, Cakile edentula, and Myrica cerifera. Typical species of brackish and salt marshes include Spartina alterniflora, S. patens, and S. cynosuroides, Juncus roemerianus, Scirpus spp., Limonium nashii, Salicornia spp., Pluchea purpurascens, Kosteletzkya virginica, Iva frutescens, Aster tenuifolius and A. subulatus. Other species of interest encountered less frequently in brackish marsh peripheries include Lilaeopsis chinensis, Triglochin striata, and Centella asiatica.

Fresh-water marshes were not nearly as extensive within the county as brackish ones. They were found primarily in the uppermost reaches of tidal creeks where salinity decreases, and such species as Typha angustifolia and T. latifolia gradually replace Spartina species. Other associated plants include Scirpus validus, Hibiscus moscheutos, and Asclepias incarnata.

Fresh-water swamps, on the other hand, occur frequently in the county and provide one of the richest and most interesting habitats. Swamp floras associated with the floodplains of small streams, such as that surveyed along the North End Branch in the vegetational analysis for this study, could actually be divided into two subgroups. One includes primarily emergent and marginal vegetation directly associated with the stream itself, where such typical herbaceous species as Sagittaria longirostra, Peltandra virginica, Lobelia cardinalis, Chelone obliqua, Alisma subcordatum, and Callitriche heterophylla are found. In the floodplain and adjacent low woods, however, a different species constellation is present. Shrubs and trees of the floodplain include Lindera benzoin, Cornus stricta, Ilex verticillata, Ilex decidua, Betula nigra, Nyssa sylvatica, and Carpinus caroliniana. Herbs of note discovered in the spring in the alluvium of the floodplain include Claytonia virginica, Erythronium americanum, Ophioglossum vulgatum, and Anemone quinquefolia.

In slightly higher areas along the floodplain, trees such as Ulmus americana, Fraxinus americana, Liriodendron tulipifera, Acer

rubrum, Ilex opaca, Platanus occidentalis, Quercus michauxii, Q. falcata var. pagodaefolia, Q. phellos, and Liquidambar styraciflua occur. Noteworthy here also is Carya aquatica, occurring in some slightly drier places but also observed in standing water in the swamp. (See vegetational analysis for information regarding relative dominance of species.)

Another type of swamp investigated was characteristically not associated with a stream as such, but rather consisted of a very low, or poorly drained area, such that standing water was present. Typical tree and shrub species encountered here in addition to many of those listed above for the floodplain, include Itea virginica, Leucothoe racemosa, Fraxinus caroliniana, and Viburnum nudum, as well as Polygonum arifolium, Leersia oryzoides, Glyceria obtusa, and Carex jooi, C. gigantea, and C. crinita.

One habitat quite distinct from the rest of the county was found along the bluffs and steep ravines bordering the Piankatank River as well as the Chop Creek area, where elevation reached as much as 30 feet above sea level. Trees found on the flat upland as well as on the steep slopes include Quercus prinus, Q. stellata, Q. velutina, Q. falcata, and Q. alba, Liriodendron tulipifera, Fagus grandifolia, Liquidambar styraciflua, Cornus florida, Carya pallida and C. tomentosa. Also noteworthy, though not so frequently encountered, are Castanea dentata and C. pumila, with one specimen of the latter measuring 4.2 inches in diameter. On steep slopes, Kalmia latifolia was particularly abundant along with Quercus prinus. Species seen



along the slopes that are not found elsewhere in the county are Hexastylis virginica, Sanguinaria canadensis, Epigaea repens, and Hydrangea arborescens. (See vegetational analysis for information regarding relative dominance of species.)

The lowland, mixed pine-deciduous woods are characterized by an uneven terrain, with low, somewhat boggy depressions distributed irregularly among slightly higher areas. Scattered individuals of Pinus taeda appear along with Liriodendron tulipifera, Acer rubrum, Liquidambar styraciflua, Ilex opaca, Cornus florida, and occasionally Magnolia virginiana. Other species encountered in this rather heterogeneous habitat include Rhododendron atlanticum, Mitchella repens, Lycopodium flabelliforme, Cypripedium acaule, Gaylussacia baccata, and Vaccinium corymbosum.

Disturbed areas within the county are comprised mainly of mowed roadsides and roadside ditches, cultivated fields and waste borders, and abandoned homesites. Weedy species of such genera as Desmodium, Trifolium, Erigeron, Eupatorium, Lespedeza, Solidago, and Daucus carota, as well as grasses such as Panicum, Paspalum, Andropogon, Erianthus, Eragrostis and Danthonia are regularly seen along road shoulders. Roadside ditches provide many species of Carex, Rhynchospora, and Eleocharis, as well as such herbs as Oenothera biennis, Ludwigia spp., Xyris spp., and Cicuta maculata. Some interesting species of wet, swaley roadsides include Polygala lutea, Lycopodium appressum, Habenaria cristata, and Gentiana catesbaei. Farm fields and borders yield Xanthium strumarium, Datura

stramonium, Ipomoea coccinea, Eclipta alba, Sida spinosa and many others. Such introduced woody species as Albizia julibrissin, Lycium halimifolium, Ligustrum sinense, Maclura pomifera, and Acer saccharinum occur around old homesites.

## VEGETATIONAL ANALYSIS

Sampling of the steep, forested bluffs along the Piankatank River in the extreme northwest corner of the county revealed Quercus prinus as the dominant species, with a relative dominance value of 29.7%. Quercus velutina ranked a close second with 21.4%, followed by Liquidambar styraciflua at 16.6% and Q. alba with 10.7% relative dominance. The importance of Q. prinus in this upland woods is in contrast with the findings of DeWitt and Ware (1979) for the hardwood forests of the central Coastal Plain of Virginia, since they observed that chestnut oak, although often present in the Coastal Plain, was much less likely to be dominant here than in Piedmont hardwood stands. However, it must be noted that the Piankatank bluffs site was selected in part due to its unique character and species composition compared with the rest of Mathews County; thus it is not surprising that analysis revealed dominant species considered uncharacteristic for Coastal Plain upland woods. In addition, Ware has noted that Q. prinus is commonly found on ravine slopes along the James and York rivers, a specific habitat quite similar to that of this site (Ware, pers. comm.). Species ranking in the top seven for this sampling site, which were also reported among the seven most important trees by DeWitt and Ware, included Q. alba, Q. falcata, Liriodendron tulipifera, and

Liquidambar styraciflua. An additional species, Carya pallida, shared a relative dominance of 4.7% at the Piankatank site with Liriodendron tulipifera and Cornus florida.

Analysis of sampling in the swamp associated with the North End Branch revealed Acer rubrum as the dominant species (19.6%), followed closely by Liquidambar styraciflua with 18.0%. Ranking third was Carpinus caroliniana (9.8%), followed by Carya aquatica (9.0%), believed to be close to its northernmost limit in Mathews County. This assemblage of species in the top five importance rankings seems to be in fairly close agreement with findings reported by Glascock and Ware (1979) for forested stream bottoms in the Peninsula of Virginia. They encountered Acer rubrum, Fraxinus pennsylvanica, Liquidambar styraciflua, Carpinus caroliniana, and Ulmus americana (in order of decreasing importance) as their most important species. One difference at the North End Branch site was the presence and importance of Carya aquatica, a species not reported by Glascock and Ware for forested stream bottoms in the Peninsula. The structural role of Carya aquatica in the configuration of this swamp is not clear from these preliminary findings, but a wide range of size classes was noted, with large, medium, and small trees present, as well as numerous seedlings. Thus, it is clear that the population is reproducing within the confines of the area. The presence of such large trees (the maximum

tree measured 33.7 inches in diameter, by far the largest tree in the swamp) also indicates that the Water Hickories are not recent additions to the vegetational complex. On the other hand, so many large dead ashes (probably Fraxinus pennsylvanicus) were noted during sampling that separate data were collected in order to interpret what might have been the structure of the community previously. When numbers of dead ashes were included, rankings of relative dominance changed dramatically, such that Fraxinus moved from sixth in importance ( $2.67 \text{ m}^2/\text{ha}$ ) to the most dominant tree ( $8.67 \text{ m}^2/\text{ha}$ ), with Acer rubrum second in order. When recently dead trees were included, the relative importance of ashes in the community coincides more closely with that reported by Glascock and Ware.

Also in agreement with Glascock and Ware's findings was the absence of Q. nigra and Magnolia virginiana from the North End Branch site, both of which have been reported by Gemborys and Hodgkins (1971) and Monk (1966) as being important in Coastal Plain stream-bottoms in Alabama and Florida, respectively. However, with Acer rubrum, Fraxinus sp., and Liquidambar styraciflua ranking high in relative dominance, the North End Branch woods can be seen as structurally quite similar to analogous Coastal Plain communities in Alabama and Florida, as well as Virginia's Piedmont (Gemborys, 1974; Gemborys and Hodgkins, 1971; and Monk, 1966).

Table 2  
 Relative Dominance  
 Piankatank River Upland Woods

Species	Absolute Dominance*	Relative Dominance in %
<u>Quercus prinus</u>	10.0	29.7%
<u>Quercus velutina</u>	7.2	21.4
<u>Liquidambar styraciflua</u>	5.6	16.6
<u>Quercus alba</u>	3.6	10.7
<u>Liriodendron tulipifera</u>	1.6	4.7
<u>Carya pallida</u>	1.6	4.7
<u>Cornus florida</u>	1.6	4.7
<u>Quercus falcata</u>	.8	2.3
<u>Ilex opaca</u>	.4	1.2
<u>Quercus falcata</u> var. <u>pagodaefolia</u>	.4	1.2
<u>Sassafras albidum</u>	.4	1.2
<u>Pinus virginiana</u>	.4	1.2

\*in m<sup>2</sup>/ha, cross-sectional area breast high

Table 3  
Relative Dominance  
North End Branch Swampwoods

Species	Absolute Dominance*	Relative Dominance in %
<u>Acer rubrum</u>	8.00	19.7%
<u>Liquidambar styraciflua</u>	7.33	18.0
<u>Carpinus caroliniana</u>	4.00	9.8
<u>Carya aquatica</u>	3.67	9.0
<u>Liriodendron tulipifera</u>	3.00	7.4
<u>Ilex opaca</u>	2.67	6.6
<u>Fraxinus</u> sp.	2.67	6.6
<u>Quercus michauxii</u>	2.33	5.7
<u>Betula nigra</u>	2.00	4.9
<u>Platanus occidentalis</u>	1.67	4.1
<u>Ulmus americana</u>	1.00	2.5
<u>Quercus phellos</u>	.67	1.6
<u>Quercus falcata</u> var. <u>pagodaefolia</u>	.67	1.6
<u>Ostrya virginiana</u>	.33	.8
<u>Pinus taeda</u>	.33	.8
<u>Nyssa sylvatica</u>	.33	.8

\*in m<sup>2</sup>/ha, cross-sectional area breast high

## PHYTOGEOGRAPHY OF SELECTED SPECIES

Four species are reported in this study which represent northern limit extensions along the East Coast, namely Fraxinus caroliniana, Eryngium prostratum, Euphorbia heterophylla, and Chelone cuthbertii. Fraxinus caroliniana, chiefly a Coastal Plain species, occurs from Florida, Georgia, Alabama, Mississippi, North and South Carolina north to Virginia, while Eryngium prostratum follows the same range, occurring in Tennessee and Kentucky as well. Both these species have been reported from counties in eastern Virginia, south of Mathews. Thus the first two limit extensions can be viewed simply as a slightly northward step in a basically southern distribution.

In the third case, Euphorbia heterophylla, which has been reported previously in Virginia solely from Isle of Wight and Dinwiddie Counties, is apparently a weedy, invading species occurring in disturbed habitats and waste places. It has a somewhat spotty distribution, occurring throughout the southeastern Coastal Plain, north to Virginia on the East Coast, as well as in Indiana, Wisconsin, Minnesota, and South Dakota (Fernald, 1950). On the other hand, Chelone cuthbertii is a plant of a much more limited and



curiously disjunct distribution, being a species found only from the mountains of North Carolina and from bogs and meadows of southeastern Virginia. Previous to this study it had been found only in Henrico County, Newport News, and Suffolk, had not been reported in the state since 1939, and was listed as "Status Unknown" and possibly extirpated within the state. This plant is believed to be vulnerable to drainage of habitats (Porter, 1979).

Two additional species at or near their northern East Coast limit, which have been previously reported in the literature, are Quercus virginiana and Carya aquatica. Quercus virginiana ranges along the coast from Mexico to southeastern Virginia, with remnants of a once continuous strip of maritime Live Oak forest remaining in Hampton, Norfolk, and Virginia Beach (Wise, 1977). The northernmost station for natural populations of Live Oak occurs at New Point Comfort in Mathews County (Harvill, 1966; Wise, 1977); it is not known whether its presence there on the southernmost tip of the county represents a relict population, or a more recent introduction from points further south. The oldest trees are on an island, with younger specimens scattered in the marsh of the adjacent mainland. Quercus virginiana is of special concern within the state due to its vulnerability to coastal development, but is "easily planted to offset losses" (Porter, 1979). Carya aquatica is a species most frequently found in Coastal Plain bottomlands and swamps, ranging from Texas to Florida and north to Virginia, as well as Illinois and Missouri (Fernald, 1950). It has been reported from the extreme

southeastern counties of Virginia, and occurs in the Dragon Run system of Middlesex County, where it reaches its apparent northern limit (Donna M. E. Ware, pers. comm.).

Another species collected which represents an eastern, rather than a northern limit extension, and is of interest due to its restricted range, is Aster grandiflorus. One of ten outer Coastal Plain records for this study, this showy species is known from numerous Piedmont and inner Coastal Plain counties in Virginia. The only other state in which it occurs is North Carolina, where it is reported throughout the Piedmont and from only one outer Coastal Plain county. [Although Small and Fernald describe this species as ranging from Florida to Virginia (1933; 1950), later authors list it as occurring only in Virginia and North Carolina, east of the mountains (Radford et al., 1968; Gleason and Cronquist, 1963)].

A small but thriving colony of Virginia Pinweed, Lechea maritima var. virginica, was found behind the rear dunes, adjacent to the marsh at Diggs. This plant, endemic to the Coastal Plain, is listed as threatened in the latest Smithsonian Institution compilation of threatened or endangered plants of the U.S. (Ayensu and de Fillips, 1978). The species ranges along the coast from Maine to Maryland, but the variety is listed as occurring only in eastern Maryland and Virginia (Fernald, 1950). It has been designated as "threatened" within the state of Virginia, probably due to loss of habitat from extensive coastal development (Porter, 1979).

Anemone quinquefolia ranges from Canada to New Jersey, west to Iowa, and in the mountains south to Georgia (Gleason and Cronquist,

1963), with disjunct populations in the Coastal Plain of Virginia (Harvill et al., unpublished manuscript) and North Carolina (Radford, et al., 1968). The few Coastal Plain records for Virginia include Gloucester County (Greaves, unpublished manuscript), Virginia Beach, New Kent, and Henrico Counties (Harvill et al., unpublished manuscript). In Mathews County, this species was found only in the alluvial woods adjacent to the North End Branch, but could be described as locally abundant at this site in April.

Two other elements of the flora of Mathews County are species not native to the U.S., which appear to be extending their range in Virginia. Salpichroa organifolia, a solanaceous weed originally introduced from South America, has been reported in North and South Carolina, Georgia, Florida, Louisiana, and California. It was first noted as occurring in Virginia in 1974 (Greg Frank, V.P.I. & S.U., pers. comm.), and to date has been collected only in Lancaster County, Newport News, and Norfolk (Harvill, et al., unpublished manuscript). It was found in Mathews County in a sandy waste area near an old wharf along the North River, and apparently may follow waterways as a means of dissemination. This plant has been placed on the state quarantine list under the Noxious Weed Law by the Board of Agriculture and Commerce, since it is considered a potential threat as an agricultural pest species (Greg Frank, V.P.I. & S.U., pers. comm.).

Tussilago farfara, or Coltsfoot, is an Old World native which seems to be following a general pattern of migration in the U.S.

from north to south. From its northern limit in Newfoundland, it has been found ranging south through New Jersey, Pennsylvania, Ohio, and Maryland, and was reported in West Virginia as early as 1933. By 1962 it was on record in the extreme western part of Virginia, in Rockbridge, Warren, Bath, and Highland Counties (Johnson, 1972). Within the state it followed that general pattern of southeastern movement, and by 1977 had spread throughout most of the western counties, into the Piedmont, with a few Coastal Plain records as well (Harvill, et al., unpublished manuscript). It is not known from North Carolina as yet (Radford, et al., 1968). The plants seen in Mathews County were growing along a sandy spoil bank next to a channelized stream. In reaching this station, Tussilago farfara may have come to the end of its eastward migration within the state, unless it appears in the future on Virginia's Eastern Shore.

Distribution Records and  
Annotated Checklist of the Vascular Flora  
of Mathews County

A total of 640 species representing 372 genera of 114 families of vascular plants are recorded here from Mathews County; ten of these species are reported here for the first time for the outer Coastal Plain of Virginia, that is, those counties bordering on the Chesapeake Bay or the Atlantic Ocean. These species are Carex squarrosa, Elaeagnus pungens, Euphorbia heterophylla, Cassia obtusifolia, Chelone cuthbertii, Urtica dioica, Eryngium prostratum, Aster grandiflorus, Prenanthes autumnalis, and Tussilago farfara. In addition, a total of 50 species are newly reported as records for the Middle Peninsula of Virginia (Gloucester, Middlesex, Essex, King and Queen, King William and Mathews Counties) and as such were not reported by Train (1979), Greaves (unpublished manuscript), or other authors in the literature. New records for Mathews County resulting from this study total 467 species.

In the checklist nomenclature follows Radford, Ahles, and Bell (1968) except for the treatment of the Linaceae, after Gleason and Cronquist (1963), and for Fimbristylis castanea, Lechea maritima var. virginica, and Tussilago farfara, after Fernald (1950). Species preceded by an asterisk represent county records, while species that are Middle

Peninsula records are preceded by a double asterisk (\*\*). Species newly reported for the outer Coastal Plain are preceded by three asterisks (\*\*\*). Relative abundance for each species is indicated by the following abbreviations: R, rare; U, uncommon; O, occasional; C, common; and A, abundant. The habitat from which each species was collected is noted and followed by the author's collecting number. A summary of the taxa collected is shown in Table 4.

Table 4  
Summary of the Taxa

	Pteridophyta and Coniferophyta	Monocots	Dicots
Families	12	15	87
Genera	17	86	269
Species	26	168	446

Total Families: 114

Total Genera: 372

Total Species: 640

ANNOTATED CHECKLIST

PTERIDOPHYTA

ASPIDIACEAE: \*Athyrium asplenioides (Michaux) A. A. Eaton, O, bottomland woods, 189. \*Onoclea sensibilis L., C, ditches and swampy areas, 563. \*Polystichum acrostichoides (Michaux) Schott, C, bottomland woods, 329, 438. \*Thelypteris hexagonaptera (Michaux) Weatherby, R, mature beech woods, 876. T. noveboracensis (L.) Nieuwland, O, bottomland woods, 190. \*T. paulstris Schott, O, marshes and roadside ditches, 669.

ASPLENIACEAE: \*Asplenium platyneuron (L.) Oakes, O, slopes along rivers, 85.

BLECHNACEAE: Woodwardia areolata (L.) Moore, C, low woods, 188. \*W. virginica (L.) Smith, U, edge of low woods, 569.

LYCOPODIACEAE: \*Lycopodium appressum (Chapman) Lloyd and Underwood, O, sphagnum roadside swales, 407. \*L. flabelliforme (Fernald) Blanchard, C, mixed pine-deciduous woods, 191. \*L. obscurum L., C, mixed deciduous woods, 231.

OPHIOGLOSSACEAE: \*Botrychium dissectum Sprengel, C, mixed deciduous woods, 187. B. virginianum (L.) Swartz, O, low woods, 330. \*Ophioglossum



vulgatum L. var. pycnostichum Fernald, R, alluvium of floodplain, 299.

OSMUNDACEAE: \*Osmunda cinnamomea L., O, creek banks and moist roadsides, 291. \*O. regalis L. var. spectabilis (Willd.) Gray, O, mixed deciduous woods, 671.

PTERIDACEAE: \*Dennstaedtia punctilobula (Michaux) Moore, O, pinewoods, 607. \*Pteridium aquilinum (L.) Kuhn, C, old fields and roadsides, 69.

SELAGINELLACEAE: Selaginella apoda (L.) Spring, U, creek bank, 297.

EQUISETACEAE: \*Equisetum arvense L., U, overgrown area on banks of river, 378.

#### CONIFEROPHYTA

CUPRESSACEAE: Juniperus virginiana L., O, dry woods and marsh borders, 770.

PINACEAE: \*Pinus echinata Miller, R, edge of woods near finger of brackish marsh, 754. \*P. taeda L., C, low woods, 776. P. virginiana Miller, C, dry woods, edges of fields, 370.

TAXODIACEAE: Taxodium distichum (L.) Richard, U, swamp adjacent to Piankatank River, 655.

#### ANTHOPHYTA

##### MONOCOTYLEDONEAE

ALISMACEAE: \*Alisma subcordatum Raf., U, swales and ditches of old roadbed in clearcut field, 525. \*Sagittaria longirostra (Mitcheli) J. G. Smith, U, along channelized stream, 859.

AMARYLLIDACEAE: Narcissus pseudo-narcissus L., C, persistent from cultivation on grassy roadsides, 923.

ARACEAE: \*Arisaema triphyllum (L.) Schott, U, sandy floodplain of creek, 301. \*Peltandra virginica (L.) Kunth, O, streams and swamps, 646.

COMMELINACEAE: \*Commelina communis L., C, moist roadsides, 122. \*C. virginica L., U, near freshwater swamp, 702.

CYPERACEAE: Bulbostylis capillaris (L.) C. B. Clarke, C, swales and ruts in fields, 493. \*Carex albolutescens Schweinitz, C, on river banks and on dunes at beach, 386, 772. \*C. annectens Bicknell, O, wet roadsides, 319. \*C. complanata Torr. and Hook., O, roadsides, 8. \*C. crinita Lam., C, freshwater swamps and river banks, 703, 844. \*C. debilis Michaux, O, bottomland deciduous woods, 417. C. frankii Kunth, O, ditches in clearcut fields, 68. \*C. gigantea Rudge, U, in black gum swamp, 589. \*C. intumescens Rudge, O, swales and ditches, 566. \*C. joorii Bailey, U, standing water of black gum swamp, 588. \*C. lupulina Muhl. ex Schkuhr, O, low marshy areas, 747. \*C. lurida Wahlenberg, C, grassy overgrown meadows, 29, 318. \*\*\*C. squarrosa L., U, along stream bank, 860. \*C. swanii (Fernald) Mackenzie, O, roadside ditches, 321. Cyperus esculentus L., C, beach and salt marsh edges, 466, 611. C. filicinus Vahl, O, behind dunes near salt marshes, 613. \*C. filiculmis Vahl, O, sandy roadsides, 355. C. grayi Torrey, O, moist ditches and fields, 113. \*C. lancastriensis Porter, U, near disturbed area at building site, 658. \*C. odoratus L., C, salt marshes and beaches behind dunes, 159. \*C. ovularis (Michaux) Torrey, O, in small streams, 446. \*\*C. polystachyos Rottb. var. texensis (Torrey) Fernald, U, in sand intrusion into Spartina marsh, 162.

\*C. pseudovegetus Steudel, C, grassy roadside ditches, 21. C. retrorsus Chapman, O, roadside shoulders, 654. C. strigosus L., O, edges of ponds and ditches, 617. \*C. tenuifolius (Steudel) Dandy, U, weedy rows of cornfield, 882. \*Eleocharis fallax Weatherby, U, freshwater swamp, 688. \*E. obtusa (Willd.) Schultes, A, swales, puddles and ditches in fields, 320, 539, 866. \*E. tenuis ? (Willd.) Schultes, R, ruts in cleared field, 630b. \*\*E. tuberculosa (Michaux) R. & S., A, ditches and farm ponds, 460. \*Fimbristylis autumnalis (L.) R. & S., C, cleared fields and ditches, 568. F. castanea (Michaux) Vahl, C, brackish marshes, 612b. \*Fuirena pumila Torrey, C, boggy areas, 697. \*Rhynchospora capitellata (Michaux) Vahl, A, pond edges and ditches, 553, 571, 672, 762b, 854. R. chalarocephala Fernald and Gale, R, ditch in cleared field, 153. \*\*R. corniculata (Lam.) Gray, C, roadruts and ditches of fields, 524. R. inexpansa (Michaux) Vahl, edges of ponds and ditches, 152, 762a. \*Scirpus americanus Persoon, O, edges of Spartina marshes, 163, 214. \*S. cyperinus (L.) Kunth, A, ditches, 155. \*S. robustus Pursh, O, salt marshes, 86. \*S. validus Vahl, O, freshwater marshes, 94.

DIOSCOREACEAE: \*Dioscorea batatas Dcne., U, on crepe myrtle by old cemetery, 767. \*D. villosa L., O, on Smilax in rich woods, and near low, wet field, 449, 489.

IRIDACEAE: Iris pseudacorus ? L., U, cypress swamp, 648. \*Sisyrinchium angustifolium Miller, C, roadsides, 23. \*S. mucronatum Michaux var. atlanticum (Bicknell) Ahles, O, grassy edges of woods, 450.

JUNCACEAE: \*Juncus acuminatus Michaux, O, ditches and edges of woods, 16. J. biflorus Ell., C, wet meadows and fields, 54, 463. \*J. bufonius

L., U, gravelly roadside, 442. \*J. canadensis J. Gay ex La Harpe, A, clearcut fields and ditches, 154b. \*J. coriaceus Mackenzie, U, along disturbed roadbed area in rich woods, 895. J. debilis Gray, C, roadsides and woodland edges, 356, 500. \*J. dichotomus Elliott, C, roadside ditches and marshes, 364, 612. \*J. effusus L., O, roadside ditches, 30. \*J. repens Michaux, U, freshwater swamp, 699. \*J. roemerianus Scheele, C, brackish marshes, 388. J. scirpoides Lam., O, drainage ditches and low-lying clearcut fields, 60. \*J. tenuis Willd., A, roadside ditches and clearings, 67, 365. \*Luzula bulbosa (Wood) Rydberg, O, roadsides, 259.

JUNCAGINACEAE: \*\*Triglochin striata R. & P., U, fresh and brackish marsh areas, 752.

LEMNACEAE: Spirodela polyrrhiza (L.), U, in pool along river bank, 376.

LILIACEAE: \*Allium vineale L., A, roadsides and fields, 7, 404, 441. \*Asparagus officinalis L., U, near salt marsh, 77. \*Erythronium americanum Ker., U, sandy floodplain of creek, 286. \*Hemerocallis fulva L., A, roadsides, 361. \*Medeola virginiana L., U, mixed deciduous woods, 396. \*Muscari racemosum (L.) Miller, O, grassy dooryards, 269. \*Ornithogalum umbellatum L., U, weedy edge of cemetery, 307. \*Smilacina racemosa (L.) Desf., U, mixed deciduous woods, 427, 413. \*Smilax bona-nox L., U, brackish marsh edge, 650. \*S. glauca Walt., U, edge of powerline cut through woods, 686, 862. \*S. herbacea L., U, low woods next to pond, 698. \*S. rotundifolia L., C, thickets, hedgerows, edge of swamp near sandy beach, 649. \*Uvularia sessilifolia L., R, rich mesic woods, 298. \*Yucca filamentosa L., U, gravelly roadside near bridge, 422.

ORCHIDACEAE: \*Cypripedium acaule Aiton, C, edges of mixed pine-deciduous woods, 344. \*Goodyera pubescens (Willd.) R. Brown, O, lowland woods, 331, 546. Habenaria cristata (Michaux) R. Brown, U, sphagnous, grassy low roadside, 475. H. lacera (Michaux) Lodd., U, wet meadow, 434. \*Isotria verticillata (Muhl. ex Willd.) Raf., R, mixed deciduous woods, 399. \*Liparis lilifolia (L.) Richard, U, rich woods, 665. \*Malaxis unifolia Michaux, O, in humus by decaying stumps, rich woods, 192, 383. \*\*Spiranthes cernua (L.) Richard, U, boggy area inside pinewoods, 615. \*S. vernalis Englem. and Gray, C, roadside swales and ditches, 12, 432. \*Tipularia discolor (Pursh) Nuttall, C, mixed deciduous woods, 193, 520.

POACEAE: \*\*Agrostis hyemalis (Walter) BSP., C, alongside ditches of clearcut fields, 632. \*A. perennans (Walter) Tuckerman, O, along ditches, 633. \*Aira caryophyllea L., O, roadsides, 340, 366. Ammophila breviligulata Fernald, O, in clumps on dunes, 212. \*Andropogon scoparius Michaux, C, weedy disturbed areas, 652, 893. \*A. ternarius Michaux, O, roadsides and weedy areas, 894. \*A. virginicus L., C, near brackish marshes and in disturbed areas, 215, 905. A. virginicus var. abbreviatus (Hackel) Fernald and Griscom, U, overgrown field near creek, 791. \*Anthoxanthum odoratum L., C, grassy roadbanks and dooryards, 245. \*Aristida dichotoma Michaux, O, sandy roadsides, 620. \*\*A. virgata Trinius, U, roadside bank near low woods, 922. \*Arthraxon hispidus Thunb. var. cryptatherus (Hackel) Honda, C, woodland edges, 695. \*\*Axonopus furcatus (Flugge) Hitchcock, R, edge of dirt road into pinewoods, 585. \*\*Bromus japonicus Thunberg, U, sandy edge of woods, 384. \*Calamagrostis

cinnoides (Muhl.) Barton, A, clearings and powercuts through woods, 793, 851, 899. Cenchrus tribuloides L., U, sandy roadside, 81. \*Cinna arundinacea L., C, roadside shoulders and woodland edges, 206. \*Cynodon dactylon (L.) Persoon, C, sandy openings and roadsides, 443. \*Dactylis glomerata L., O, clearings and dooryards, 411. \*Danthonia sericea Nuttall, O, dry roadsides, 352, 363. \*D. spicata (L.) Beauvois ex R. & S., C, roadsides, 659. \*Digitaria ischaemum (Schreber) Muhl., C, sandy roadsides, 920. \*D. sanguinalis (L.) Scopoli, C, roadsides, 919. Distichlis spicata (L.) Greene, O, behind dunes on beaches, 464. \*Echinochloa crusgalli (L.) Beauvois, C, overgrown fields, 125. \*E. walteri (Pursh) Heller, U, edge of marsh, 593. \*Eleusine indica (L.) Gaertner, A, overgrown fields, roadside shoulders, 683, 890, 912. \*Elymus virginicus L., A, beaches and brackish marshes, 43, 473, 495. Eragrostis curvula (Schrader) Nees, O, along roadbanks, 440. \*E. hirsuta (Michaux) Nees, O, roadsides, near woods, 645. \*\*E. refracta (Muhl.) Scribner, O, roadsides and cleared fields, 572. E. spectabilis (Pursh) Steudel, C, roadsides and clearcuts, 131, 497. \*Erianthus contortus Baldwin ex Ell., A, roadsides and clearcuts, 186, 687, 782. \*E. giganteus (Walter) Muhl., O, roadside ditches, 846. Festuca rubra L., U, above salt marsh on slightly higher ground, 777. Glyceria obtusa (Muhl.) Trinius, O, freshwater swamps, 689. \*Holcus lanatus L., C, roadsides, 342, 408. Hordeum pusillum Nuttall, O, waste places, near brackish marshes, 209. \*Leersia oryzoides (L.) Swartz, O, ditches and swamps, 143, 704. \*L. virginica Willd., O, ditches in fields, 903. \*Lolium perenne L., U, roadside near low field, 481. \*\*Muhlenbergia schreberi J. F. Gmelin, U,

weedy yard by horse barn, 771. \*Panicum anceps Michaux, O, roadsides, 660. \*P. clandestinum L., O, woodland edges, roadsides, 582. \*P. commutatum Schultes, O, clay river banks, 387. \*\*P. depauperatum Muhl., R, roadside near edge of dry woods, 653. P. dichotomiflorum Michaux, C, sandy beaches, 172, 595. \*P. dichotomum L., O, weedy edges of mixed woods, 385. P. lanuginosum Ell. var. lanuginosum (Elliott) G., O, near roadside ditch, 367. \*P. rigidulum Nees, C, weedy fields, 184, 591. \*P. scoparium Lam., C, roadsides and woodland edges, 34, 144. \*P. verrucosum Muhl., O, moist woodland edges, 603. P. virgatum L., A, waste areas and marsh borders, 109, 123, 164. \*Paspalum dilatatum Poir., C, road shoulders, 784. \*P. floridanum Michx., O, roadsides and powerline cuts through woods, 861. \*P. laeve Michaux, O, roadsides, 783. \*P. setaceum Michaux, O, roadsides, 496. \*Phleum pratense L., O, roadsides, 439. Phragmites communis Trinius, O, clearcut fields and salt marsh borders, 156. \*Poa annua L., U, edge of woods and roadsides, 393. Setaria geniculata (Lam.) Beauvois, O, beach and edges of marsh, 594. \*S. viridis (L.) Beauvois, O, roadsides, 867. \*\*Sorghastrum nutans (L.) Nash, A, powerline cuts, woodland borders, 208, 562, 870. \*Sorghum halepense (L.) Persoon, C, overgrown fields and weedy areas, 461, 812. \*Spartina alterniflora Loisel., A, salt marshes, 211. \*S. cynosuroides (L.) Roth, O, in brackish marshes, 196. S. patens (Aiton) Muhl., A, beaches and salt marshes, 71. Sporobolus poiretti (R. & S.) Hitchcock, U, roadsides, 786. \*Tridens flavus (L.) Hitchcock, A, roadsides, 130. Triplasis purpurea (Walt.) Chapm., C, sand dunes, 608. Tripsacum dactyloides L., O, overgrown fields, 462. \*Uniola laxa (L.) BSP., C, roadsides and woodland edges, 474.

TYPHACEAE: \*Typha angustifolia L., O, freshwater swamps, 92. T. latifolia L., O, freshwater swamps, 91.

XYRIDACEAE: \*Xyris difformis Chapman, C, damp low-lying cleared fields and ditches, 573. \*\*X. jupicai Richard, O, damp cleared fields, 574.

ZOSTERACEAE: Zostera marina L., U, on flats off New Point Comfort, 614.

#### DICOTYLEDONEAE

ACANTHACEAE: \*Ruellia caroliniensis (Walter) Steudel, O, grassy edges of woods, 20.

ACERACEAE: \*Acer rubrum L., A, mixed deciduous lowland woods, 232. \*A. saccharinum L., R, abandoned homesite, 914.

AIZOACEAE: Mollugo verticillata L., A, beaches, fields, weedy edges, 74, 534, 881.

AMARANTHACEAE: \*Amaranthus cannabinus (L.) J. D. Sauer, U, near brackish marsh, 201. \*A. hybridus L., O, weedy fields, 210b.

ANACARDIACEAE: Rhus coppallina L., A, powercuts, roadsides, woods edges, 140. \*R. radicans L., A, disturbed areas, pinewoods, 741.

ANNONACEAE: Asimina triloba (L.) Dunal, A, moist, low woods, 283.

APIACEAE: Centella asiatica (L.) Urban., R, edge of woods and marsh, 766. \*Chaerophyllum tainturieri Hooker, U, weedy area at cemetery edge, 281. \*Cicuta maculata L., A, roadside ditches, 93, 456, 556. \*Daucus carota L., A, roadsides, fields, 25, 49. \*\*\* Eryngium prostratum Nuttall, R, grassy roadside, 31b. Hydrocotyle umbellata L., O, roadside ditches,



near brackish marshes, 468. \*H. verticillata Thunb., O, brackish marshes, 815. \*Lilaeopsis chinensis (L.) Kuntze, R, edge of salt marsh, 753. \*Oxypolis rigidior (L.) Raf., R, brackish marsh, 751. \*Sanicula canadensis L., U, rich deciduous woods, 428.

APOCYNACEAE: \*Apocynum cannabinum L., C, roadside waste areas, 157. \*Vinca minor L., U, grassy roadbank, 244.

AQUIFOLIACEAE: Ilex decidua Walter, O, swampy woods, 736, 852. I. opaca Aiton, A, pine and mixed hardwoods, 232a. I. verticillata (L.) Gray, U, freshwater swampwoods, 701.

ARALIACEAE: Aralia spinosa L., C, overgrown fields, 141. \*Hedera helix L., R, near old cemetery, 536.

ARISTOLOCHIACEAE: \*Aristolochia serpentaria L., R, low woods near floodplain of creek, 300. \*Hexastylis virginica (L.) Small, R, shaded slopes and bluffs above Piankatank River, 420.

ASCLEPIADACEAE: \*Asclepias incarnata L., O, freshwater marshes, 90. A. syriaca L., O, weedy overgrown fields, 62. \*A. tuberosa L., U, roadside near ditch, 405. Matelea sp., R, sterile, in rich woods, 680.

ASTERACEAE: \*Achillea millefolium L., A, roadsides, 27, 875. \*Ambrosia artemisiifolia L., A, roadsides, 176. \*Antennaria plantaginifolia (L.) Richardson, C, roadsides, grassy banks, 266. \*Anthemis arvensis L., U, roadside near clearcut, 327. \*\*\*Aster grandiflorus L., U, with willows at edge of marsh, 210. \*A. lateriflorus (L.) Britton, C, open fields near road shoulders, 785. \*\*A. novae-angliae L., U, in clearing of bottomland woods, 728. \*\*A. novi-belgii L., C, fresh and brackish marshes, 692, 755, 809. \*A. paternus Cronquist, C,

roadsides, 452. \*A. pilosus Willd., C, roadsides, 785b. \*A. solidagineus Michaux, C, grassy areas, woodland edges, 13. \*A. subulatus Michaux, C, margins of salt marsh, 599. \*A. tenuifolius L., C, at edges of salt marshes, 115. Baccharis halimifolia L., A, on dunes at marsh edges, 174. \*Bidens aristosa (Michaux) Britton, O, roadsides, near ditches, 97, 104b. \*B. frondosa L., C, roadsides and dooryards, 218. B. laevis, (L.) BSP., U, small streambed near cultivated field, 874. \*B. polylepis Blake, C, roadsides, 136, 673. \*B. tripartita L., U, next to channelized stream, 730. \*Borrchia frutescens (L.) DC., C, salt flats adjacent to Spartina marsh, 610. \*Cacalia atriplicifolia L., O, edges of roads and roadside ditches, 533. \*Carduus discolor (Muhl. ex Willd.) Nuttall, A, clearcut fields, 134. \*\*Centaurea maculosa Lam., C, roadsides, 451. \*Chrysanthemum leucanthemum L., A, roadsides, 6, 28, 324. \*Cichorium intybus L., A, along roadsides, 432. \*Coreopsis lanceolata L., U, roadside, 17. \*Eclipta alba (L.) Hasskarl, U, overgrown farm field, 807. \*Elephantopus carolinianus Willd., C, openings in woods, 729, 805. \*E. nudatus Gray, O, fields and dooryards, 135. E. tomentosus L., O, woodland edges and clearings, 795. \*Erechtites hieracifolia (L.) Raf., C, near ditches in clearcut fields, 154a. Erigeron annuus (L.) Persoon, A, roadsides and weedlots, 323, 391, 531, 907. E. strigosus Muhl. ex Willd., C, roadsides and weedlots, 24, 325. \*Eupatorium aromaticum L., R, roadside at edge of woods, 664. \*E. capillifolium (Lam.) Small, A, roadsides and clearcut fields, 221. \*E. coelestinum L., A, fields and roadsides, 98. \*E. dubium Willd., C, ditches in clearcut fields, 119, 637. \*E. hyssopifolium L., A, roadsides and woodland edges, 105, 145,

207. E. pilosum Walter, C, clearcut fields, 146, 638. E. rotundifolium L., O, dry roadsides, 106. \*E. serotinum Michaux, O, roadsides, 148. \*Galinsoga ciliata (Raf.) Blake, U, under willow oak along dirt road, waste areas, 515, 806. Gnaphalium obtusifolium L., O, overgrown roadsides and fields, 527. G. purpureum L., A, roadsides and waste areas, 328, 471. Helenium amarum (Raf.) H. Rock, U, gravel at road edge, 180. \*H. autumnale L., U, roadside ditch near cornfield, 749. \*H. flexuosum Raf., U, roadside grassy bank, 55. \*Helianthus angustifolius L., R, weedy strip near roadside ditch, 570. \*Heterotheca graminifolia (Michaux) Shinnery, R, along slope by river, 709. \*H. mariana (L.) Shinnery, O, roadsides, 678. \*Hieracium gronovii L., C, edges of woods, 532. Hypochoeris radicata L., C, roadsides, 177, 454. Iva frutescens L., C, edges of coastal pine-myrtle thickets, 160. \*\*Krigia dandelion (L.) Nuttall, C, woodland edges and banks of creeks, 289. K. virginica (L.) Willd., C, dry areas and weedy edges, 280. \*Lactuca canadensis L., C, waste areas, 70. \*Liatris graminifolia Willd., R, sandy roadside, 639. \*Mikania scandens (L.) Willd., C, roadsides, 95, 482. \*Pluchea camphorata (L.) DC., C, ditches in clearcut fields, 631. P. foetida (L.) DC., O, boggy areas, 696. \*P. purpurascens (Swartz) DC., C, brackish marshes, 158, 197. \*Polymnia uvedalia L., O, roadsides and openings in woods, 549, 794. \*\*\*Prenanthes autumnalis Walter, R, mossy border between dooryard and woods, 788. \*P. serpentaria Pursh, O, roadsides, 897. Pyrrhopappus carolinianus (Walter) DC., C, roadsides, 69b, 458. \*Rudbeckia hirta L., O, roadsides, 38, 230. Senecio aureus L., O, damp woods and creek banks, 275. \*S. smallii Britton, O, overgrown fields, 433. \*S. tomentosus

Michaux, C, roadside weedy areas, 308, 438. Solidago altissima L., O, clearcut fields, 623. \*S. bicolor L., O, roadsides, 892. \*S. caesia L., O, edges of woods, 880. S. erecta Pursh, O, roadsides, 663. \*\*S. fistulosa Miller, C, near beaches, overgrown fields, 598, 798. S. graminifolia (L.) Salisbury, C, clearcut fields, 222, 624. \*S. microcephala (Greene) Bush, A, clearcuts and dunes, 167, 616, 636. \*S. nemoralis Ait., C, clearcut fields, 622. \*S. odora Ait., O, roadsides and clearcuts, 57, 849. \*S. pinetorum Small, U, behind marsh along river, 796. S. puberula Nuttall, U, roadside, 829. \*S. rugosa Miller var. rugosa, C, clearcuts, 118. S. rugosa var. celtidifolia (Small) Fernald, O, low deciduous woods, 202. S. sempervirens L., C, dunes and marsh borders, 194. \*S. tenuifolia Pursh, U, in water of farm pond, 616. Taraxacum officinale Wiggers, A, weedlots and roadsides, 264. \*\*\*Tussilago farfara L., R, steep bank of creek, 294. \*Verbesina occidentalis (L.) Walter, C, wood edges and marsh borders, 682, 801. \*Vernonia noveboracensis (L.) Michaux, O, ditches in clearcut fields, 66. \*Xanthium strumarium L. var. strumarium, O, sand dunes, 171. X. strumarium var. glabratum (DC.) Cronquist, O, weed in farm fields, 216.

BALSAMINACEAE: \*Impatiens capensis Meerb., O, along river banks, 550.

BERBERIDACEAE: \*\*Berberis thunbergii DC., R, edge of woods near cemetery, 830. Podophyllum peltatum L., O, moist woods, 273.

BETULACEAE: Alnus serrulata (Aiton) Willd., C, along streams, 529, 707. \*Betula nigra L., C, along floodplains of streams, 302. Carpinus caroliniana Walter, C, floodplains of streams, 560. \*\*Ostrya virginiana, O, low deciduous woods, 203.

BIGNONIACEAE: \*Anisostichus capreolata (L.) Bureau, O, on swampwoods trees, 723. Campsis radicans (L.) Seemann, C, woodland edges and overgrown roadsides, 44.

BORAGINACEAE: \*Lithospermum arvense L., O, roadsides, 276. \*Myosotis arvensis (L.) Hill, O, roadsides, 240. \*M. discolor Persoon, O, weedy lawns, 311.

BRASSICACEAE: \*Arabidopsis thaliana (L.) Heynhold, C, roadsides, 236, 277. \*Barbarea verna (Miller) Ascherson, C, fields and streambanks, 235, 290. \*B. vulgaris R. Brown, C, weedy fields, 234. Cakile edentula (Bigelow) Hooker, C, beaches behind dunes, 73. \*Cardamine hirsuta L., C, weedy fields, 237. \*Draba verna L., U, overgrown cultivated field, 279. Lepidium virginicum L., C, roadsides, 316, 350. \*Raphanus raphanistrum L., C, roadsides, 394, 425b. Rorippa islandica (Oeder) Borbas, U, damp area by dooryard, 412. \*Teesdalia nudicaulis R. Brown, C, roadsides, 261.

CACTACEAE: \*Opuntia compressa (Salisbury) Macbride, R, gravelly roadside near bridge, 87.

CALLITRICHACEAE: Callitriche heterophylla Pursh, U, swales of old roadbed, 284.

CAMPANULACEAE: \*Lobelia cardinalis L., C, ditches, streambanks and swamps, 114, 647. \*L. inflata L., O, roadsides and woods, 541, 583. \*L. nutallii R. & S., O, roadsides, 42. \*L. puberula Michaux, C, cleared fields, 126, 565. \*L. siphilitica L., U, low area near stream, 63. Specularia perfoliata (L.) A., DC., C, grassy roadsides, 4.

CAPRIFOLIACEAE: Lonicera japonica Thunberg, A, roadsides and disturbed areas, 469. L. sempervirens L., O, woodland edges, 436.

Sambucus canadensis L., C, freshwater swamp edges, 88. Symphoricarpos orbiculatus Moench., O, mixed deciduous woods, 226, 430. Viburnum nudum L., O, swamps and wood edges, 359, 641.

CARYOPHYLLACEAE: \*Cerastium glomeratum Thuillier, C, weedy fields, 272. \*C. semidecandrum L., R, grassy dooryard, 779. \*Dianthus armeria L., O, waste roadside areas, 65. Scleranthus annuus L., C, weedy fields, 263. \*Stellaria media (L.) Cyrillo, C, weedy fields, 239, 337, 375.

CELASTRACEAE: Euonymus americanus L., U, rich woods, 444.

CHENOPODIACEAE: Atriplex patula L., O, behind first dunes, 173. Chenopodium album L., R, sandy area adjacent to marsh, 213. C. ambrosioides L., O, overwash area on beaches, 169. Salicornia europaea L., O, dense colonies near Spartina marshes, 609a. S. virginica L., O, near edges of Spartina marshes, 609b. Salsola kali L., O, edges of salt marshes, 170.

CISTACEAE: Lechea maritima Leggett var. virginica Hodgdon, R, one colony adjacent to salt marsh, 165. \*L. racemulosa Michx., U, sandy disturbed area near construction, 640.

CLETHRACEAE: Clethra alnifolia L., C, edges of woods along roadsides, 224.

CONVOLVULACEAE: Calystegia sepium (L.) R. Brown, C, along streambanks and roadsides, 72, 373. \*Cuscuta campestris Yunker, C, weedy fields, 127, 483. \*C. compacta Jussieu, O, roadsides and pond edges, 761. \*C. gronovii Willd. ex R. & S., A, freshwater swamps and roadsides, 643, 700. \*\*Dichondra carolinensis Michaux, R, at grassy edge of driveway, 808. \*Ipomoea coccinea L., C, weed in fields, 104. \*I. hederacea (L.)

Jacquin, O, twining over roadside vegetation, 667. \*I. lacunosa L., O, on dunes, 108.

CORNACEAE: Cornus florida L., A, mixed deciduous woods, 270. \*C. stricta Lam., U, edge of woods near creek, 304.

CRASSULACEAE: \*Penthorum sedoides L., O, ditches in clearcut fields, 626.

CUCURBITACEAE: \*Melothria pendula L., U, sunny edge of woods, 511.

EBENACEAE: \*Diospyros virginiana L., O, edges of salt marshes, 205.

ELAEAGNACEAE: \*\*\*Elaeagnus pungens Thunberg, R, thicket by fencerow, 48a.

ERICACEAE: \*Chimaphila maculata (L.) Pursh, C, mixed deciduous woods, 345. \*Epigaea repens L., R, eroding banks of Chop Creek, 877.

\*Gaylussacia baccata (Wang.) K. Koch, C, low woods, 402. Kalmia latifolia L., U, slopes overlooking Piankatank River, 421. \*Leucothoe racemosa (L.) Gray, O, near edge of swamps, 581. \*Lyonia ligustrina (L.) DC., O, low woods, 847. \*Monotropa hypopithys L., R, mixed deciduous woods, 759. \*M. uniflora L., O, wet depressions in mixed woods, 354. Oxydendrum arboreum (L.) DC., C, edges of woods, 41, 821. Rhododendron atlanticum (Ashe) Rehder, C, low woods, 3, 360. R. viscosum (L.) Torrey, C, low woods, 848. \*Vaccinium atrococcum (Gray) Porter, C, edges of mixed deciduous woods, 248. \*V. corymbosum L., A, low woods, 35, 347, 401.

EUPHORBIACEAE: \*Acalypha rhomboidea Raf., C, near ditches and streams, 722, 910. \*Croton glandulosus L. var. septentrionalis Muell-Arg., U, roadside, 83. \*\*\*Euphorbia heterophylla L., R, road shoulder near bridge, 552. \*E. maculata L., O, overgrown field edges,

124. \*E. supina Raf., O, on low dunes, 168. \*\*Phyllanthus caroliniensis Walter, O, fallow fields, 635.

FABACEAE: Albizia julibrissin Durazzini, O, near abandoned homesites, 40. Amphicarpa bracteata (L.) Fernald, O, twining on roadside vegetation, 667b. \*Apios americana Medicus, O, freshwater marshes, 75. Cassia fasciculata Michaux, C, roadsides, 488. \*\*C. marilandica L., U, in opening in low woods, 727. \*C. nictitans L., U, near dirt driveway, 887. \*\*\*C. obtusifolia L., U, weedy rows of cornfield, 885. \*Centrosema virginianum (L.) Bentham, O, overgrown fields, 526a. \*Cercis canadensis L., C, near abandoned homesites, edges of woods, 246. \*Cytisus scoparius (L.) Link, U, roadside, 453. \*Desmodium glutinosum (Muhl. ex Willd.) Wood, O, rich woods, 506. \*D. paniculatum (L.) DC., C, roadsides and powercuts, 100, 543. \*D. pauciflorum (Nuttall) DC., O, rich woods, 506. \*\*Galactia macreei M. A. Curtis, U, roadside near abandoned farmyard, 484. \*Gleditsia triacanthos L., U, near roadside ditch at woods edge, 790. Lathyrus hirsutus L., O, roadsides, 431. \*L. latifolius L., U, weed lot, 423. \*Lespedeza bicolor Turcz., C, roadside weed, 129. \*L. capitata Michaux, O, grassy road shoulders, 217. \*L. cuneata (Dumont) G. Don, O, dry roadsides, 107. \*L. striata (Thunberg) H. & A., C, weedy roadsides, 720, 886. \*L. virginica (L.) Britt., C, roadside ditches, 868. \*Melilotus alba Desr., O, roadsides, 472. \*Rhynchosia difformis (Ell.) DC., U, overgrown roadside field, 526b. Robinia pseudo-acacia L., U, near edge of woods, 312. \*Strophostyles helvola (L.) Ell., O, sandy areas between marsh and beach, 166. \*S. umbellata (Muhl. ex Willd.) Britton, C, roadsides and cleared fields, 586, 629. \*Stylosanthes biflora (L.) BSP.,



O, roadsides and wood edges, 514. \*Tephrosia spicata (Walter) T. & G., O, roadsides, 50. \*Trifolium arvense L., O, gravelly roadsides, 11. \*T. campestre Schreber, C, edges of low woods, grassy areas, 5. \*T. hybridum L., U, sand of dooryard, 410. \*T. pratense L., C, roadsides, 335. T. repens L., O, roadsides, 336. \*Vicia angustifolia Reichard, O, roadsides, 268. \*V. dasycarpa Tenore, O, overgrown weedlots, 424. \*V. hirsuta (L.) S. F. Gray, O, roadsides. 326. \*V. villosa Roth, U, roadside disturbed area, 674.

FAGACEAE: \*Castanea dentata (Marshall) Borkh., U, on bluffs above river, 714. C. pumila (L.) Miller, U, edge of rich woods, 666, 715. Fagus grandifolia Ehrhart, O, wooded ridges and bluffs above river, 713. \*Quercus alba L., A, mixed deciduous woods, 710, 816. \*Q. coccinea Muenchh., O, mixed woods, 757. Q. falcata Michaux, A, mixed deciduous woods, 719. Q. falcata var. pagodaefolia Ell., C, swampwoods, 587. \*Q. michauxii Nutt., C, low woods and streambanks, 80, 822. \*Q. muehlenbergii Engelm., U, on small ridges in beech-tulip tree woods, 871. Q. nigra L., C, bottomland woods, 725, 823. \*Q. phellos L., C, low woods bordering marsh, 200. \*Q. prinus L., O, on bluffs along rivers, 739. Q. rubra L., C, mixed deciduous woods, 826. \*Q. stellata Wang., O, on bluffs above rivers, 712, 817. Q. velutina Lam., C, mixed deciduous woods, 818. Q. virginiana Miller, R, on small "island" of higher ground in salt marsh, 1.

GENTIANACEAE: Bartonia virginica (L.) BSP., O, in dry pinewoods, 607b. Gentiana catesbaei Walter, O, wet roadsides near ditches, woodland edges, 219. \*Sabatia angularis (L.) Pursh, C, wet fields, 490. S. stellaris Pursh, O, brackish marshes, 619.

GERANIACEAE: Geranium carolinianum L., C, roadsides near ditches,  
339. \*G. dissectum L., C, weedlots, 265.

HALORAGACEAE: Proserpinaca palustris L., O, roadside ditches, 590,  
855.

HAMMAMELIDACEAE: \*\*Hamamelis virginiana L., U, near fencerow, 48b.  
Liquidambar styraciflua L., A, low mixed woods, 675.

HYPERICACEAE: Hypericum canadense L., C, roadsides, 601. \*H.  
gentianoides (L.) BSP., C, roadside waste areas, 711. \*H. gymnanthum  
Engelm. & Gray, C, roadsides, 602. H. hypericoides (L.) Crantz, C,  
roadsides near rich woods, 102, 503. H. mutilum L., C, deciduous woods,  
413. \*H. perforatum L., O, weedlots, 425. \*H. punctatum Lam., C, weedy  
wet fields, 478. \*H. virginicum L., C, edges of ponds, 760, 856.

JUGLANDACEAE: \*Carya aquatica (Michaux f.) Nuttall, U, throughout low  
bottomland woods and along channelized stream, 635, 750. \*C. cordiformis  
(Wang.) K. Koch, C, mixed low woods, 763. C. illinoensis (Wang.) K. Koch,  
R, edge of dirt road by wharf, probably persistent from cultivation, 798.  
\*C. pallida (Ashe) Engl. & Graebn., O, along slopes overlooking rivers,  
842. \*C. tomentosa Nutt., C, in dry woods on higher ground, 828. \*Juglans  
nigra L., R, between farm field and edge of river, 813.

LAMIACEAE: \*Glechoma hederacea L., C, near roadside ditches, grassy  
areas, 254. \*Lamium amplexicaule L., C, weedy cutover fields, 238. \*L.  
purpureum L., O, roadside weedy areas, 242. \*Lycopus americanus Muhl. ex  
Barton, O, low-lying fields, 479. L. virginicus L., C, wood edges and  
stream banks, 545, 555. \*Mentha piperita L., U, near broken pavement  
behind department store, 902. \*Monarda punctata L., U, roadside field,

528. Prunella vulgaris L., C, weedy roadsides and fields, 64, 476.  
 \*Pycnanthemum tenuifolium Schrader, C, low fields adjacent to streams,  
 480. \*Salvia lyrata L., C, roadsides near ditches, 341. \*Scutellaria  
elliptica Muhl., O, edges of mesic woods, grassy areas, 66. \*S.  
integrifolia L., C, grassy roadsides, 19, 349. \*\*Stachys hyssopifolia  
 Michaux var. ambigua Gray, U, overgrown low field, 731. Teucrium  
canadense L., O, edges of marshes and by myrtle thicket behind dunes, 597.

LENTIBULARIACEAE: \*Utricularia biflora Lam., U, small pond at  
 entrance to low woods, 606. U. sp., sterile, in swamp with Glyceria  
obtusa, 690.

LAURACEAE: Lindera benzoin (L.) Blume, A, swampy floodplains and low  
 woods, 288, 551. Sassafras albidum (Nuttall) Nees, C, edges of mixed  
 deciduous woods, 247.

LINACEAE: \*Linum medium (Planch.) Britt., C, roadsides, 14, 485. \*L.  
striatum Walter, A, roadside waste places, 362, 523, 600, 618.

LOGANIACEAE: \*Cynoctonum mitreola (L.) Britton, U, wet boggy field  
 near stream, 746. \*Polypremum procumbens L., O, sandy roadsides, 584.

LYTHRACEAE: \*Decodon verticillatus (L.) Ell., O, in boggy muck of  
 swamps, 642. \*Rotala ramosior (L.) Koehne, C, ditches and stream edges,  
 disturbed areas, 132, 625.

MAGNOLIACEAE: \*\*Liriodendron tulipifera L., C, mixed deciduous woods,  
 677. \*Magnolia grandiflora L., R, probably persistent from cultivation at  
 edge of jeep trail into disturbed woods, 778. \*M. virginiana L., O, low  
 mixed pine-tulip tree woods, 346.

MALVACEAE: \*Abutilon theophrastii Medicus, U, weedy area near broken pavement behind department store, 900. Hibiscus moscheutos L., O, freshwater marshes, 89. Kosteletskya virginica (L.) Presl., C, edges of brackish marshes, 204, 522. \*Sida spinosa L. U, weed in cornfield, 724.

MELASTOMATACEAE: Rhexia mariana L. var. mariana, C, ditches of clearcut fields and roadsides, 32, 58. R. mariana var. purpurea Michaux, C, roadside ditches, 575. \*R. virginica L. var. virginica, C, ditches in clearcut fields, 59.

MORACEAE: \*\*Maclura pomifera (Raf.) Schneider, R, near fencerow by old cemetery, 810. Morus rubra L., O, lower wooded slopes, 656.

MYRICACEAE: Myrica cerifera L., A, edges of salt marshes, scrub woods, and thickets, 175. \*\*M. heterophylla Raf., R, scattered in low woods near pond, 756.

NYSSACEAE: Nyssa sylvatica Marshall var. sylvatica, C, mixed deciduous woods, 45. N. sylvatica var. biflora (Walter) Sargent, O, in swamps and pocosins, 579.

OLEACEAE: \*Fraxinus americana L. var. americana, O, edges of woods near streams, 447. \*F. caroliniana Miller, O, freshwater swamps, 705. \*Ligustrum sinense Lour., R, field near fencerow, 909. L. amurense? Carr, U, along fencerow, 908.

ONAGRACEAE: \*Circaea lutetiana (of authors) ssp. canadensis (L.) Ascherson & Magnus, O, mixed deciduous woods, 426. Epilobium coloratum Biehler, O, ditches and swales in low fields, 732. Ludwigia alternifolia L., C, roadside ditches, 498. \*\*L. glandulosa Walter, O, waterfilled ditches in clearcuts, 845. L. linearis Walter, A, ditches, swales and

boggy areas, 56, 605, 694. \*Oenothera biennis L., C, roadsides near ditches, 137.

OROBANCHACEAE: \*Epifagus virginiana (L.) Barton, O, moist deciduous woods, 397b.

OXALIDACEAE: \*Oxalis dillenii Jacquin, C, roadsides and edges of woods, 811. O. rubra St. Hil., O, weedy areas, 310. \*O. stricta L., C, roadsides and woodland edges, 512. \*O. violacea L., U, sandy bank of creek, 295.

PAPAVERACEAE: \*Sanguinaria canadensis L., R, a few plants on slopes above Piankatank River, 676.

PASSIFLORACEAE: Passiflora lutea L., U, sunny edge of rich woods, 510.

PHYRMACEAE: \*Phyrma leptostachya L., U, rich woods, 508.

PHYTOLACCACEAE: \*Phytolacca americana L., A, weedy areas, marsh edges, fencerows, 112.

PLANTAGINACEAE: \*Plantago aristata Michaux, C, gravelly roadsides, 53. P. lanceolata L., C, weedy areas, 314. \*P. rugelii Dcne., A, roadsides and weedy areas, 223. P. virginica L., C, roadsides, 257.

PLATANACEAE: Platanus occidentalis L., C, low woods and stream edges, 726.

PLUMBAGINACEAE: Limonium nashii Small, O, salt marshes, 116.

POLYGALACEAE: Polygala lutea L., O, low, grassy roadside swales, 36. P. mariana Miller, C, roadside shoulders and grassy areas, 15, 409.

POLYGONACEAE: \*Polygonum arifolium L., O, boggy soil of swamp edges, 644. P. aviculare L., U, spreading on beach sand, 596, 679. \*P. hydropiperoides Michaux, O, grassy areas at woods edges, 26. P.

hydropiperoides var. opelousanum (Riddell ex Small) Stone, O, wide swaley ditches, 459. P. pennsylvanicum L., A, roadside ditches and marsh edges, 161. \*P. persicaria L., C, roadsides and weedy areas, 750b. P. sagittatum L., C, ditches and swamps, 139, 691. Rumex acetosella L., C, roadsides, 256. \*R. conglomeratus Murray, C, waste areas and weedy fields, 390, 487, 768. \*R. crispus L., C, weedy fields, 121. \*R. pulcher L., O, grassy roadsides, 403. \*Tovara virginiana (L.) Raf., O, edges of overgrown fields, near low woods, 559.

PORTULACACEAE: \*Claytonia virginica L., O, floodplains near streams, 285. \*Portulaca oleracea L., R, in temporary puddle at edge of old roadbed near clearcut field, 61.

PRIMULACEAE: \*Anagallis arvensis L., R, near roadside ditch, 323b. \*Lysimachia nummularia L., U, roadside in gravelly area, 51. \*L. quadrifolia L., O, mixed pine-deciduous woodland edges, 383. \*Samolus parviflorus Raf., U, in standing pools at edge of river, 372.

RANUNCULACEAE: \*Anemone quinquefolia L., U, one locally widespread colony on wooded floodplain of creek, 298. \*A. virginiana L., U, in rich mesic woods, 535. \*Aquilegia canadensis L., U, spreading along cliffs and banks of Piankatank River, 380. \*Ranunculus abortivus L., O, in low swampy woods, 274. R. bulbosus L., A, roadsides and dooryards, 260. \*R. carolinanus DC., O, edges of floodplains of swamps, 287, 293. \*R. pusillus Poiret, O, swales in roadbed, ditches through cut-over woods, 283b. \*R. sardous Crantz, O, roadsides near ditches, 333.

ROSACEAE: \*Agrimonia parviflora Aiton, U, edge of field near low swampwoods, 558b. \*A. pubescens Wallroth, O, edges of mixed woods, 544.

\*Amelanchier arborea (Michaux f.) Fernald, C, mixed low woods, 241.  
 \*Duchesnea indica (Andrz.) Focke, O, roadside grassy areas, 270b. \*Geum canadense Jacquin, C, rich mesic woods, 505, 800. \*Potentilla canadensis L., C, roadsides and lawn edges, 271. \*P. simplex Michaux, O, roadsides and meadows, 322. \*\*Prunus angustifolia Marshall, U, in margin between field and stream bank, 303. \*P. persica (L.) Batsch, R, edge of woods near roadside, 255. P. serotina Ehrhart, A, old homesites, edges of woods, 306. \*Pyrus communis L., U, probably persistent from cultivation at woodland edge, 253. \*Rosa carolina L., U, roadside ditch near entrance to old wharf, 792. \*R. multiflora Thunberg, C, overgrown roadsides, 39. \*R. wichuriana Crepin, O, near roadside ditches, 416. \*Rubus argutus Link, C, thickets, edges of woods, 437. \*R. cuneifolius Pursh, O, roadside ditches, 382. \*R. flagellaris Willd., O, along road shoulders, fencerows, 850. \*R. occidentalis L., U, along dirt road leading to old wharf, 799. Sorbus arbutifolia (L.) Heynhold, C, thickets and fencerows, 17, 233.

RUBIACEAE: Cephalanthus occidentalis L., C, swamps and ditches, 52.  
Diodia teres Walter, C, in sand dunes on beach, roadsides, 744. D. virginiana L., C, roadsides and weedy areas, 96, 501. \*Galium circaezans Michaux, C, scattered in mesic woods, 429. \*G. pilosum Aiton, U, roadside near ditch, 336b. \*G. tinctorium L., A, grassy areas near ditches, 18, 336, 494. \*G. uniflorum Michaux, U, in standing water in boggy area of rich woods, 400. \*Houstonia caerulea L., C, overgrown grassy areas, 282. \*\*H. pusilla Schoepf., U, grassy roadside near lawn, 258. \*Mitchella repens L., A, mixed hardwood forests, 2. \*\*Oldenlandia uniflora L., C, ditches and low areas in cleared fields, 577, 628.

SALICACEAE: Populus alba L., R, a few trees at roadside near parking lot, 780. Salix nigra Marshall, C, banks of creeks, 317.

SANTALACEAE: \*Comandra umbellata (L.) Nuttall, O, mixed pine-deciduous woods, 343.

SAURURACEAE: \*Saururus cernuus L., O, freshwater marshes and swamps, 448.

SAXIFRAGACEAE: \*Hydrangea arborescens L., U, on high, seepy, clay cliffs by river, 84. \*Itea virginica L., O, swamps, 580.

SCROPHULARIACEAE: Agalinis purpurea (L.) Pennell, A, ditches of clearcut fields and roadsides, 117. \*Aureolaria virginica (L.) Pennell, U, edge of scrubby pine-oak woods, 455. \*\*\*Chelone cuthbertii Small, R, mossy bank near ditch, 220. C. obliqua L., C, along streams, 561. \*Gratiola pilosa Michaux, O, ditches in clearcut fields, 634. \*G. virginiana L., O, ditches at woodland edges, 415. Linaria canadensis (L.) Dumont, C, weedy roadsides and grassy areas, 313. \*Lindernia anagallidea (Michaux) Pennell, C, shallow pools in cleared fields, 576. \*Mecardonia acuminata (Walter) Small, C, low marshy areas in fields, bogs, 185, 693. \*Mimulus alatus Aiton, C, wet low fields, 477, 627. \*\*M. ringens L., U, at roadside on grassy bank, 518. \*Paulownia tomentosa (Thunberg) Steudel, U, disturbed area near clearing behind pines, 873. \*Verbascum blattaria L., O, roadside weedy areas, 457. \*V. thapsus L., O, weedy areas, sandy soil of river banks, 418. \*Veronica anagallis-aquatica L., U, small streambed in rich woods, 872. \*V. hederifolia L., C, weedy overgrown lawns, 250. \*V. serpyllifolia L., C, weedy lawn edges, 251, 538.



SOLANACEAE: \*Datura stramonium L., C, weed in cultivated fields, 78.  
 \*\*Lycium halimifolium Miller, U, spreading from old homesites alongside  
 ditch and across road, 745. Physalis heterophylla? Nees, R, near  
 powerline cut through rich woods, 547. \*\*Salpichroa organifolia (Lam.)  
 Baillon, R, one dense colony spreading along sandy edge of tidal river,  
 797. Solanum carolinense L., A, waste lots and weedy fields, 22, 225, 351.

SYMLOCACEAE: Symplocos tinctoria (L.) L'Her., U, edge of black gum  
 swamp and low woods, 37, 578.

ULMACEAE: \*Celtis laevigata Willd., C, banks of streams and swamps,  
 379, 802. \*C. occidentalis L., O, near streams in marshes, 803. \*Ulmus  
americana L., C, floodplain woods near streams, 740, 840. \*U. rubra  
 Muhl., U, sapling in field, 906.

URTICACEAE: \*Boehmeria cylindrica (L.) Swartz, O, near stream edges,  
 499. \*Pilea pumila (L.) Gray, U, by small streambed in rich beech woods,  
 878. \*\*\*Urtica dioica L., R, near dirt road leading to old wharf, 814.

VALERIANACEAE: \*Valerianella locusta (L.) L'Her., C, roadsides in  
 grassy areas, 249. \*V. radiata (L.) Dufur., C, roadsides, 334, 348.

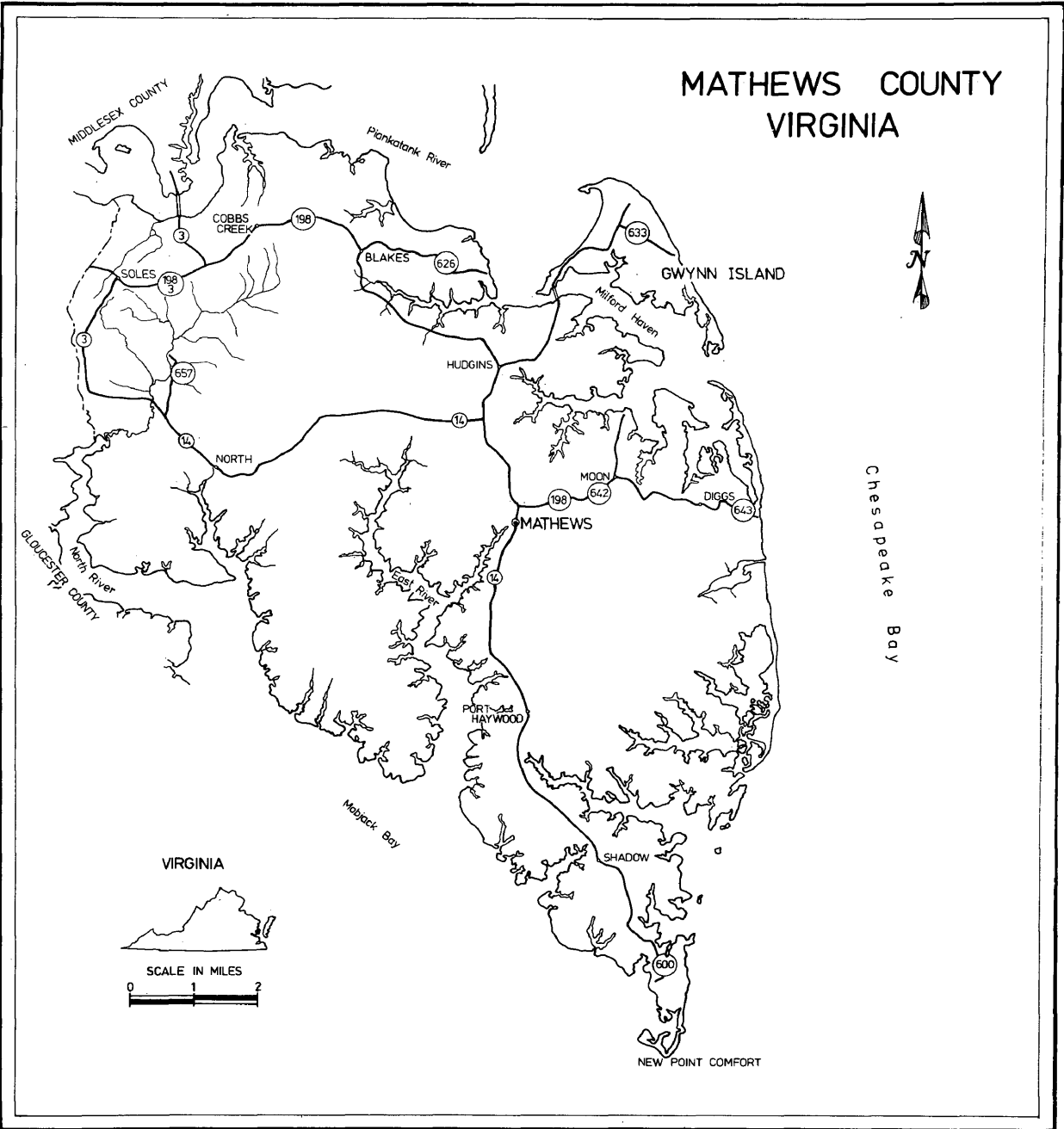
VERBENACEAE: \*Callicarpa americana L., U, near powerline cut through  
 deciduous woods, 540. \*Verbena urticifolia L., O, in rich mesic woods,  
 507.

VIOLACEAE: \*Viola affinis Le Conte, O, roadsides, 243. \*V. arvensis  
 Murray, A, in cultivated fields, dooryards, 278. V. emarginata (Nuttall)  
 Le Conte, U, top of steep bank next to channelized stream, 292. \*V.  
palmata L. var. triloba Walter, C, moist banks of roadside ditches, 262.  
 \*V. primulifolia L., O, damp roadsides and edges of rich woods, 267. \*V.  
rafinesquii Greene, A, weed in cultivated fields, 252.

VITACEAE: Parthenocissus quinquefolia (L.) Planchon, O, along slopes of rivers, 381. \*Vitis aestivalis Michaux, O, fencerows, 46. V. rotundifolia Michaux, C, fencerows, thickets and river banks, 82.

Figure 1. MAP OF MATHEWS COUNTY, VIRGINIA

# MATHEWS COUNTY VIRGINIA



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## VITA

Margaret Norman van Montfrans

Born in Orlando, Florida on October 17, 1946. Graduated from Winter Haven High School, Winter Haven, Florida in June, 1964. Graduated Phi Beta Kappa with a B.A. in English from Florida State University, Tallahassee, Florida in June of 1967. Past experience in biology included work as laboratory technologist for the State of Florida; also employed as a lab technician with a private aquatic research firm. Involved in freelance scientific illustrating from 1971 to the present. Entered the College of William and Mary in September of 1977 as a graduate teaching assistant in the Department of Biology.