NBS/NPS VEGETATION MAPPING PROGRAM

Vegetation Classification of Rock Creek Park

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In memoriam:
Virginia Crouch was also instrumental in this effort. During her time as a botanist with the DC Natural Heritage Program she assisted with the 1997 field inventory for this project. Her previous work experience at Rock Creek Park and her detailed knowledge of the regional flora was invaluable to this effort. Her sense of humor and her botanical expertise will be missed.

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Table of Contents

Vegetation Sampling and Classification 1

Introduction 1

Methods 2

Results 4

Discussion 5

References Cited 6

Vegetation Classification 7

Glossary 37

Literature Cited 38

Appendices

A. Two-Way Indicator Analysis (TWINSPAN) of Sample Plots 42

B. Detrended Correspondence Analysis (DCA) of Mixed Oak Forest Plots 44

C. Detrended Correspondence Analysis (DCA) of Floodplain & Mesic Slope Forest Plots 45

D. List of Sample Plots and Corresponding Vegetation Associations 46

Vegetation Classification and Mapping of Rock Creek National Park Using a National Framework

INTRODUCTION

A detailed description and map of the vegetation of Rock Creek Park was developed using the National Vegetation Classification System developed by The Nature Conservancy in conjunction with the Federal Geographic Data Committee and the Ecological Society of America Vegetation Subcommittee. The final product, a 1:12000 scale map with descriptions of the component types and all relating metadata files, will be evaluated for its potential to provide needed vegetation information in a format that is useful for the various operations of the National Park Service, including natural resource managers, planners, acquisition specialists, contaminants specialists, and biologists (a similar product is currently being applied at Assateague National Seashore (The Nature Conservancy 1995)). In addition, the product was also developed at Rock Creek Park to provide the natural resource managers with baseline information about the site. Although current information existed about the flora of the park (Fleming and Kanal 1995) and the locations of rare species, the map and descriptions of the park's vegetation (Anderson et al. 1977) were significantly outdated due to natural changes in the vegetation over the past 20 years. In addition, the vegetation of several outlying areas of the park had not yet been described. The Park Service desired a current map and description of the vegetation and a means of comparing and evaluating the park's resources in context of a regional and national vegetation classification. Information on community composition and rarity can help to inform decisions on management of particular areas and natural communities within the park. Such information is critical to ensure the persistence of the native plant and animal species in the park in light of human use, invasion of exotic species, deer browse, beaver activity, and other disturbances to the habitats.

The Nature Conservancy, in partnership with the network of Natural Heritage Programs, has developed a classification of vegetation of the United States (Grossman et al. 1998). This system has been adopted by the Federal Geographic Data Committee and the Ecological Society of America Vegetation Subcommittee as the national vegetation mapping standard, the National Vegetation Classification System (NVCS). Although the two systems (Grossman et al. 1988 and the NVCS) are nearly identical, The Nature Conservancy continues to refine the classification through an active review process with the state Natural Heritage Programs and academics. The basic unit of either system, the association, is roughly equivalent in scale to the plant association of European phytosociologists. The association is a unit of vegetation that is more or less homogeneous in composition and structure and occurs on uniform habitat. Above this level in the classification is the alliance, a group of associations sharing one or more dominant or characteristic species. Alliances are generally more wide-ranging geographically than are associations, although many monotypic alliances have been classified. Where the component associations of an alliance have not been classified, an association is assigned the same name as the alliance and noted as "provisional".

Although associations are defined by the plants that comprise them, they are in fact communities of all the component organisms of that association, including animals, protozoans, bacteria, and fungi. Associations are classified from a national perspective, and are assigned global rarity ranks as well as ranking specifications to be applied to individual occurrences of associations across their range. A map of associations occurring at a site can provide information about the abundance and distribution of each type, the significance of the individual occurrences, and also provides surrogate information about the location and abundance of individual species characteristic of the association.

In accordance with the standards for this national mapping effort, the vegetation of Rock Creek Park was mapped to the association level using a 0.5 hectare minimum mapping unit on 1:12000 color-infrared stereo photography flown in October 1996 (leaves on).

METHODS

Planning

Field work follows the methodology developed by The Nature Conservancy in conjunction with the NBS/NPS Vegetation Mapping Program (The Nature Conservancy 1994). The following is a summary of these methods as applied to Rock Creek Park.

Rock Creek Park is considered to be of "small size", one in which the sample area includes the entire park. Decisions regarding number of plots and plot placement by environmental stratification were based on the whole park (by comparison, in large parks, the plot placement and stratification is focused on only a section of the park, and results extrapolated to the whole).

A preliminary list of vegetation alliances that were known or suspected to occur in the Piedmont and Chesapeake Bay areas was generated based on the Eastern Regional Classification (Sneddon et al. 1996). This classification was used during a reconnaissance visit by photointerpreters, ecologists, and park staff to match aerial photo signatures with vegetation on the ground. Preliminary names were assigned to these types and their aerial photo signatures were noted. Extensively disturbed areas and developed areas were assigned labels that describe the predominant landscape feature, e.g., "mown field", "built up areas", etc. In addition, gaps in the forest canopy (often dominated by vines) were designated as "canopy openings". A minimum mapping unit of 0.25 hectare (rather than the standard 0.5 hectare) was used for these openings to address the park's interest in monitoring and controlling encroachment of forest gaps by exotic plant species.

The preliminary photointerpretation of all photos of the park was completed by Aerial Information Systems, Inc. The resulting polygon map was then used by park staff to choose plot locations. Plots were allocated to each vegetation type that had been mapped (15 types) and replicate plots were to be assigned over the environmental range of the type. For example, mixed oak forests were sampled on slopes of varying degree and aspect; streamside vegetation was sampled at various points along the stream. Where the environmental variability of the types was unknown, samples were geographically dispersed. Replicate plots were not assigned equably among all vegetation types; vegetation types that were known or suspected to be

relatively more variable were assigned more plots. In addition, photo signatures were very similar for several of the forest types. Plots were allocated to variants of vegetation types of the same signature based on the collective knowledge of the refuge staff and on apparent environmental variablity.

Field methods

Plots were subjectively placed so as to be most representative of the mapped vegetation unit. All mapped vegetation types were sampled over a range of environmental variation. Additional plots were taken where the vegetation type documented in the field was unclassified or less well known. For example, the ash floodplain map unit polygons were targeted specifically for field verification. This vegetation types was later classified as part of the *Platanus occidentalis - Fraxinus pennsylvanica* Forest Association.

Plot sizes ranged from 20 x 20 m for forests and woodlands, 10 x 10 m for shrublands, and 5 x 5 m for herbaceous vegetation. In some cases, where the polygons were too narrow to reasonably accomodate standard plot sizes, the plots were adjusted accordingly, e.g., 10 x 20 m plots were often used in sampling narrow bands of floodplain forest in the park. The vegetation was visually divided into strata, and all the species of each stratum were listed and percent cover estimated. Additional species within the vegetation unit or polygon that occurred outside of sampled plots were listed separately. Species that were not identifiable in the field were collected for later identification. In addition to floristic information, the following environmental information was recorded on field forms: soil profile description, flooding regime, soil moisture regime, slope, aspect and evidence of disturbance. Latitude and longitude of each plot was recorded using a GPS unit. The vegetation profile in cross-section was sketched by hand to represent the location and setting of the plot. Seventy-seven vegetation plots in total were sampled for this project.

Data analysis

Park plot data (77 plots) were entered by Rock Creek Park staff into The Nature Conservancy's PLOTS Database System (1997) on a Microsoft Access platform. Species were assigned standardized codes and names based on the PLANTS database developed by National Resources Conservation Service (NRCS) in cooperation with the Biota of North America Program (BONAP). For the vegetation analysis, portions of the Rock Creek Park data set were copied onto spreadsheets in a format compatible with PC-ORD Multivariate Analysis package (McCune and Mefford 1997). Plots that represented cultivated types or exotics-dominated sites were excluded from the analysis. Several outliers (plots that are very dissimilar from all the others) were identified using Sorenson and Euclidian formulas in PC-ORD and were excluded from the primary analyses. The remaining data set of 67 plots was analyzed with Detrended Correspondence Analysis/DCA (Hill and Gauch 1980) and Two-Way Indicator Species Analysis/TWINSPAN (Hill 1979). DCA ordinates both species and samples simultaneously along preceived gradients (e.g. that may indicate moisture gradient, elevation, etc.). TWINSPAN successively divides the plots into groups that are similar in species composition. The initial results indicated that some plots were artificially clustering based on high percent

cover of several exotic species. The data set was further modified to exclude these exotics and the revised data were re-analyzed with DCA and TWINSPAN.
These groups were compared with the National Vegetation Classification (Grossman et al. 1998) and matched to existing Alliances and/or Associations where appropriate.

Environmental data on soil characteristics, slope, aspect and topography for each plot were used to interpret the results. The soil survey, geologic map and topographic maps were also used in the interpretation. Plot information on flooding regime was incomplete but could be extrapolated from the polygon and plot locations delineated on air photos and topographic maps. Environmental data were analyzed using the ordination program CANOCO in PC-ORD. However, due to the small size of the study area, the relatively uniform topography of the park and some incomplete and inconsistent data on soil types and hydrology, the CANOCO results provided little additional information for the classification.

RESULTS.

Initial DCA and TWINSPAN analysis identified four vegetation groups, all of which were forest types: 1) the dry chestnut oak - black gum group, 2) a black cherry-pine-oak group, 3) a broadly defined beech - oak group and 4) a floodplain or mesic tulip poplar - boxelder group (see Appendix A). Data from the two latter groups were then analyzed separately (as two data sets) for more detailed resolution (see Appendix B and C). The tulip poplar - boxelder group subdivided into floodplain versus upland groups based on the presence or absence (or low cover value) of sycamore. Plots in this upland subset were seen as more closely aligned with group 3 above and the floodplain plots were kept within group 4 above. Additional analysis of the beech - oak group (group 3) indicated a generalized category to include mixed oak - beech - tulip poplar plus two variants or subtypes: a.) a drier oak forest sub-type and b.) a mesic tulip poplar - beech subtype. These groups represent potential alliances, associations or sub-associations at the national vegetation classification level. The results of this analysis were compared with existing classifications and matched to the national classification types as much as possible.

Comparison with forest types described in the National Vegetation Classification (Grossman et al. 1998) indicated that the four primary groups above did match four existing Alliances. However, there was not enough evidence to assign the variants of the mixed oak-beech-tulip poplar group (group 3) to separate alliances. The variants were considered to be relatively small patches within the matrix of the of the "parent" forest type. However, detailed information from the field forms did help to define two additional Alliances that were not recognized in the TWINSPAN or DCA analysis due to the small number of plots in each. These were a tulip poplar monoculture (group 5) and a Virginia pine - mixed oak forest (group 6). The final classification is presented on page 7. Variants of the beech-white oak forest are not included in the classification but are described in the text. Of the six Alliances recognized at the park, one forest type, the Loblolly pine-mixed oak forest (*Pinus taeda-Quercus (alba, falcata, stellata)* Forest) had not been previously described at Rock Creek Park or in the Eastern Regional Classification (Sneddon et al. 1994).

Vegetation descriptions include geographic range, environmental description, USFWS wetland system (Cowardin et al. 1979), most abundant species, diagnostic species, conservation rank (global rarity rank), confidence level of classification and of rarity rank and references. In addition, corresponding plots from Rock Creek Park are listed for each type with field form plot number. Conservation rank is on a scale from G1 to G5 with G1 being globally rare, and G5 being widespread and common. Confidence level of classification was rated on a scale of 1 to 3, with 1 being the highest level of confidence. New types that were undocumented in the literature or where data was sparse were given the lowest confidence rank of 3, indicating that they are classified at the alliance level only, pending further regional classification work.

All plot locations for Rock Creek Park will be transferred to the base map. When the map locations are received, the classification of each plot will be compared to the mapped unit to determine where discrepancies occur. The map will then be further checked against additional field notes and experience of the primary field worker to correct any known errors. The final results of the photointerpretation based on the the vegetation analysis and classification will later be transferred into GIS. Although we have high confidence in the accuracy of the information collected and in the map in general, a rigorous methodical accuracy assessment is beyond the scope of this project.

DISCUSSION

Rock Creek Park runs along the fall line, separating the Piedmont Plateau and the Atlantic Coastal Plain provinces. The vegetation reflects affinities to both of these provinces and is closely aligned with vegetation types described in the nearby states of Maryland, New Jersey, Pennsylvania, and Virginia. All of the natural communities at Rock Creek Park are classified as forest types ("Forest Class" in the national vegetation classification heirarchy). No natural woodland, shrubland or herbaceous communities were identified. Six forest alliances each represented by a single association were described at the park; these are outlined in the Vegetation Classification on page 7. Several variants were noted within these types but these were not sufficiently different to warrant recognition at the association level. Plots that were dominated by shrubs or vines fell within the cultivated or disturbance categories and were not considered as natural vegetation. This community was described and mapped at the request of Park personnel.

The Beech - white oak / mayapple forest association (*Fagus grandifolia - Quercus alba* / *Podophyllum peltatum* Forest Association) was the most widespread across the park. This association included five of the forest types previously defined by Anderson (1977). In contrast, the chestnut oak / black huckleberry association (*Quercus (prinus, velutina*) / *Gaylussacia baccata* Forest Association) was restricted primarily to hilltops. Uncommon in the park were remnants of the Virginia pine - oak forest indicated on the 1977 maps (Anderson et al. 1977). In twenty years most of these areas had succeeded to hardwood forest. The floodplain forests, occurring only along narrow stream corridors in the park, were all classified as one type, the Sycamore - green ash association (*Platanus occidentalis - Fraxinus pennsylvanica* Forest Association). The Coastal Plain influence was evidenced at sites such as Fort Totten and Barnard Hill where a loblolly pine - mixed oak forest association (*Pinus taeda -Quercus (alba, falcata, stellata)* Forest) occurs. This type not previously described from Rock Creek Park.

Although uncommon in the park, this association is widespread on the coastal plain from New Jersey, Maryland, Virginia, and south.

The global ranks of most or all of the vegetation types at Rock Creek Park have not been clearly defined as data on the extent of these communities is incomplete. None of the associations are considered to be very rare as they have been documented from a number of locations. Data from this project will help to further refine the rangewide descriptions, extent and the global ranks of all of these vegetation associations.

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VEGETATION CLASSIFICATION

Following is the vegetation classification for Rock Creek Park, set within the hierarchy of the National Vegetation Classification System (Grossman et al. 1998). A vegetation key to facilitate field identification of the types and a description of each vegetation type at Rock Creek Park are provided in later sections of this report.

I. Forest
IB. Deciduous forest
IB2. Cold-deciduous forest
IB2N. Natural/seminatural vegetation*

IB2Na. Lowland or submontane broad-leaved cold-deciduous forest

Fagus grandifolia - Quercus alba Forest Alliance
Fagus grandifolia - Quercus alba / Podophyllum peltatum **Forest (CEGL006075)**

Liriodendron tulipifera Forest Alliance
Liriodendron tulipifera **Forest [Provisional]**

Quercus prinus - (Q. coccinea, Q. velutina) Forest Alliance
Quercus (prinus, velutina) / Gaylussacia baccata **Forest (CEGL006282)**

IB2Ne. Seasonally flooded cold-deciduous forest

Platanus occidentalis - (Fraxinus pennsylvanica, Celtis laevigata, Acer saccharinum)
Temporarily Flooded Forest Alliance
Platanus occidentalis - Fraxinus pennsylvanica **Forest (CEGL006036)**

IC. Mixed evergreen-deciduous forest
IC2. Mixed broad-leaved evergreen cold-deciduous forest
IC2Na. Mixed needle-leaved evergreen cold-deciduous forest

Pinus taeda - Quercus (alba, falcata, stellata) Forest Alliance
Pinus taeda - Quercus (alba, falcata, stellata) **Forest [Provisional]**

Pinus virginiana - Quercus (alba, stellata, falcata, velutina)
Pinus virginiana - Quercus **(*alba*, *stellata*, *falcata*, *velutina*) Forest (CEGL006171)**

IV. Shrubland
IVB. Deciduous Shrubland
IVB2. Cold-deciduous Shrubland
IVB2a. Temperate deciduous Shrubland
Alliance undefined
***Rubus allegheniensis / Ampelopsis brevipedunculata* Shrubland**

*The heirarchy includes a level separating natural/seminatural vegetation from cultivated/managed vegetation. All but one of the descriptions in this report are of natural/seminatural vegetation and this level is implied in all of the above associations as indicated by the letter "N" in the formation label (e.g. IC2Na).

GLOSSARY

canopy - the layer formed by treetops; may be divided into separate strata to describe different heights (e.g., canopy and sub-canopy)

characteristic species - a species that occurs in many of the examples of a particular vegetation community; not related to abundance or dominance; the species may be sparse to abundant.

co-dominant - a species with relatively high abundance or percent cover shares dominance with one or several other species; typically refers to a given strata (e.g., beech, red oak and tulip poplar are codominant in the canopy)

cover (often expressed as percent cover) - aerial projection of the amount of ground surface that is covered or shadowed by a plant or a strata (e.g., shrub strata or layer)

dominant - species with the most abundant or highest percent cover; often comprising over 50% cover overall or in a given strata

ericaceous - plants belonging to the heath family (see "heath")

exotic - term used to describe a species that is not naturally occurring or native to the area (e.g., Rock Creek Park or vicinity); introduced; escaped from cultivation.

hardwood - deciduous, non-coniferous tree

heath - member of the heath family (Ericaceae); includes a number of common shrubs such as blueberry, huckleberry, azalea and mountain laurel and some herbs such as wintergreen (*Gaultheria procumbens*).

herb - a non-woody plant; an herbaceous plant

herbaceous layer - ground layer or strata comprised primarily of non-woody vegetation (herbs)

hydric - areas with wet or seasonally flooded soils; wetland soils

mesic - areas with moist, well-drained soils; neither hydric (e.g., wet, saturated, seasonally flooded) nor xeric (dry, droughty)

strata - layer of vegetation; commonly defined strata are: canopy, sub-canopy, shrub (tall shrub over 2 meters, short shrub less than 2 meters), herbaceous and vine

subcanopy - the layer formed by treetops below the canopy layer

xeric - describing areas with dry, well-drained soils

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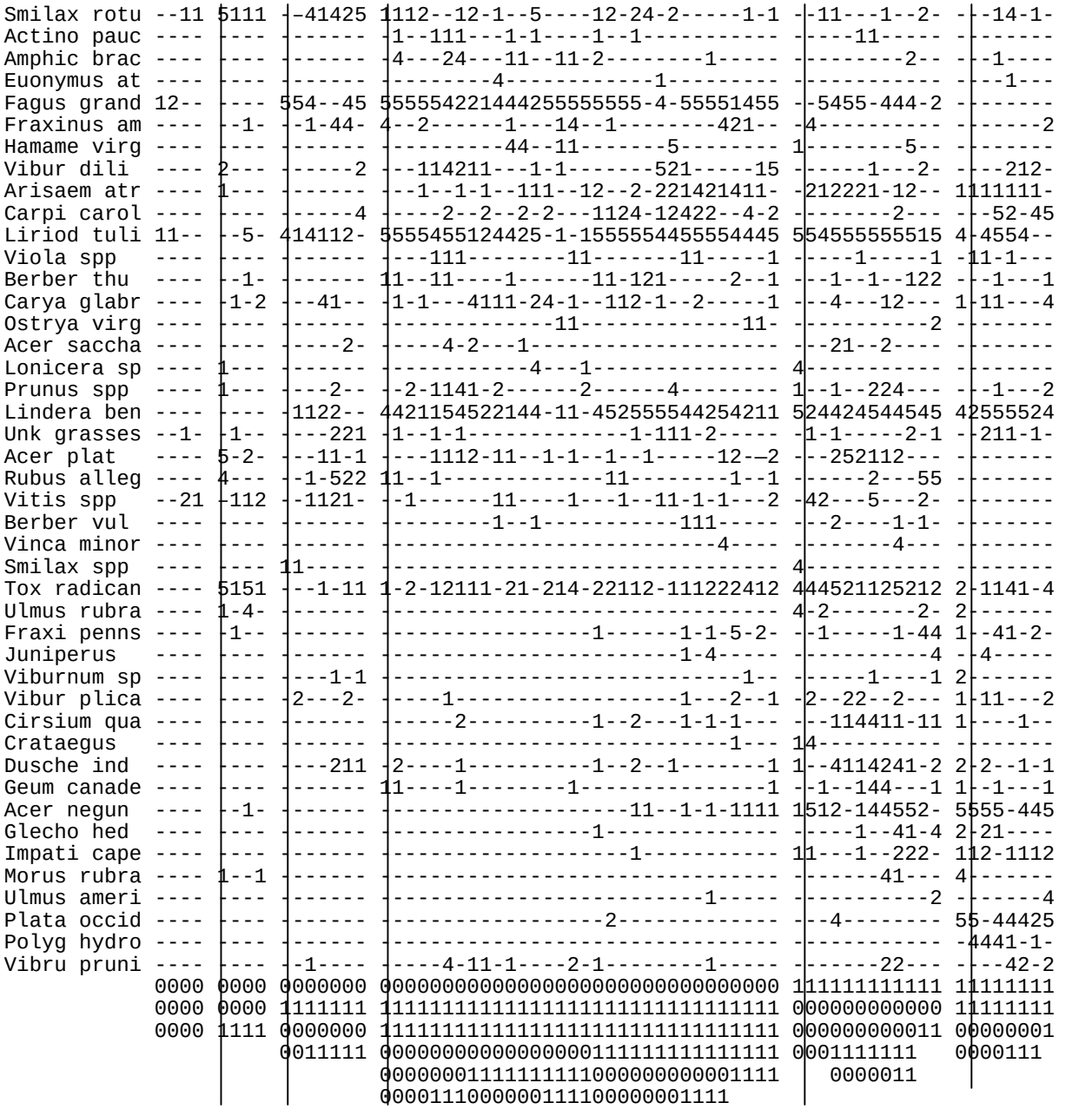
Appendices

Appendix A. Results of TWINSPAN Analysis of 67 plots from Rock Creek Park.
(dominant exotics were deleted for this analysis)

TWO-WAY ORDERED TABLE

GROUP	A	B	C		D	
	A	B	C′	C″	D′	D″
	44	4444	311448	88882281112351335 1133562235 122	62555627 6	5566127
	2889	1567	9134346	5145793189227034645678891801570 4	161523523237	49052637
Magnol tri	---4	----	------	-------5----------	----------	-------
Galluss bac	4-25	-1--	--1----	----------	----------	-------
Kalm latif	25--	----	22-----	----1--------11----1----------	----------	-------
Liquidam st	–11-	555-	------	----------	----------	-------
Pinus taeda	----	-4--	-2-----	----------	----------	-------
Prunus pens	----	-12-	---2--	---1-----1----------	----------	-------
Quercus fal	--11	24-2	-----2	----------25----------	----------	-------
Quercus phe	---1	1111	---211	----------	----------	-------
Rubus pensy	----	-444	------	----------	----------	-------
Amelanc arb	1141	-1-1	1111-5	--11-----1------11---1---2---2-	----------	-------
Polygona bi	----	-211	--11-1-	---1-----1----1--1----------	----------	-------
Quercus pri	5555	-522	4-55144	2---4-24-44-1-1---------1----1--	----------	---4---
Sassafr alb	1442	51-1	214115-	2--1-12--2-1-1-------11--------	----------	-------
Vaccin pall	5144	-1-2	-421--4	-14422--1-1--111----------11-	----------	-------
Pinus virg	-1--	-2-4	------	-445---2----------	----------	-------
Rhodo nudic	2125	----	-42----	-2--2-1---1---111-1----4--1-----	----------1	-------
Nyssa sylva	5254	4424	4152125	214254-124524221412-5-5442242-1-	----1---42-	---2----
Prunus sero	–121	4425	-21551	11-2111--11-1-112-1---11--1-421-	2-1-------21	-------
Quercus coc	----	-2-1	--41--	-------5--4----------5---------	----------	-------
Quercus vel	1112	42-1	-244---	-11---4---4--4424--1---1-21-4144	--2--------1	-------
Robinia pse	----	1142	---12-	----------1----------	--1---------	-------
Galium apar	----	----	------	--------1--------11--2--------1	----------	-------
Sanguin can	----	----	-1----	----------11-1--11----1-1	----------	-------
Cornus amom	----	----	------	---1---1112-21----2--1--1----11	----------	-------
Euonymus am	----	----	------	--1-1-------2----11-1-1------1-	----------	-------
Galium circ	----	----	------	----11--11----------11-1-1---	----------	-------
Melamp lin	----	----	1-----	-21221--11111-----2---11111--11-	----------	-------
Des nudum	----	----	------	12-22-----1----2----------	----------	-------
Quercus spp	----	----	1-----	--1---11--12--------1-1--------	----------	-------
Castan dent	11--	----	-1----	-1--111-1--11-----1---1------1--	----------	-------
Mitch repen	-1--	-2--	-1-----	144512----1----------1-11---1-	----------	-------
Viburn acer	12--	----	2-55--2	5545445454242244542221542442441	----1--1---	---1---
Rubus phen	----	----	--1---1	-2----1---------1----------12-1	-----1-----	-------
Smilac race	----	-12-	1-1-1--	111-111-1111111121111-11111-111-	--11------1	-------
Tiarella am	----	----	------	----42---1-1--------2----------	--1--------	-------
Cornus flor	----	-2--	5145441	4542245444422212-122142-4-1-252-	2142----42--	---2----
Ilex opaca	----	21-2	1111111	2121-1-1-1-1------1---11211-2411	---2----1---	-------
Quercus alb	-12-	---2	4514525	251524142-15-44544-44-24-----1-2	---2-------4	-------
Quercus rub	1112	-2-1	45--4-2	-11-444---5-544-41-------2--5-41	4----------	------1
Dioscor vil	----	----	11-----	----2---2-21--1-1--1--11--1-1---	---------1-	-------
Osmorh cla	----	----	1-1---1	11---21211111--1--21111--1--1-11	--1-1------	-------
Arisaem tri	----	----	------	----------21----------2	----------	------2
Carya cordi	----	----	------	-1--1----1-------1----------1	----------1	------1
Euonymus sp	----	----	------	----------1--------4--1--	----------2	-------
Polyst acro	----	1---	------	---11----------1111--1-2211111	1-1-11------	---1---
Carya spp	----	---1	--1---	------1-1-1-----1-1----111-----	----1------	---1---
Carya tomen	-1-1	-11-	4-2-224	4-1--245542---15-41-2-241-2-4544	--2-2--412-	1-44----
Euonymus fo	----	----	-----1	1-1----------1---4----	-1--1-1-----	-------
Rubus spp	----	1---	-----1	-1-----1-----1--------11--------	-------1---	-------
Vibur dent	----	1242	--1-22	-2--1-244-1-1----21--544-11--21-	1----2----4-	1--2----
Acer ruburm	451-	4124	454---2	424212-215552544522114421-1--112	4451421-2--4	--2-5552
Fraxinus sp	----	----	1---21-	11----------11-----21-------	---21-1----	-------
Parthenocis	----	5141	1-24121	12111214111122121111--11111111	111-11241-11	1-1111-2
Podoph pelt	----	----	--41---	---1111211211-5-2211121-42-1111	5--121----1-	1---1--1
Carex spp	-1--	-1--	--11---	---1----------1	----------	---1---1
Smilax glau	111-	2212	-4-1-1	11--------1----------1--1-1	--1---1--1-	--1----



KEY TO GROUPS

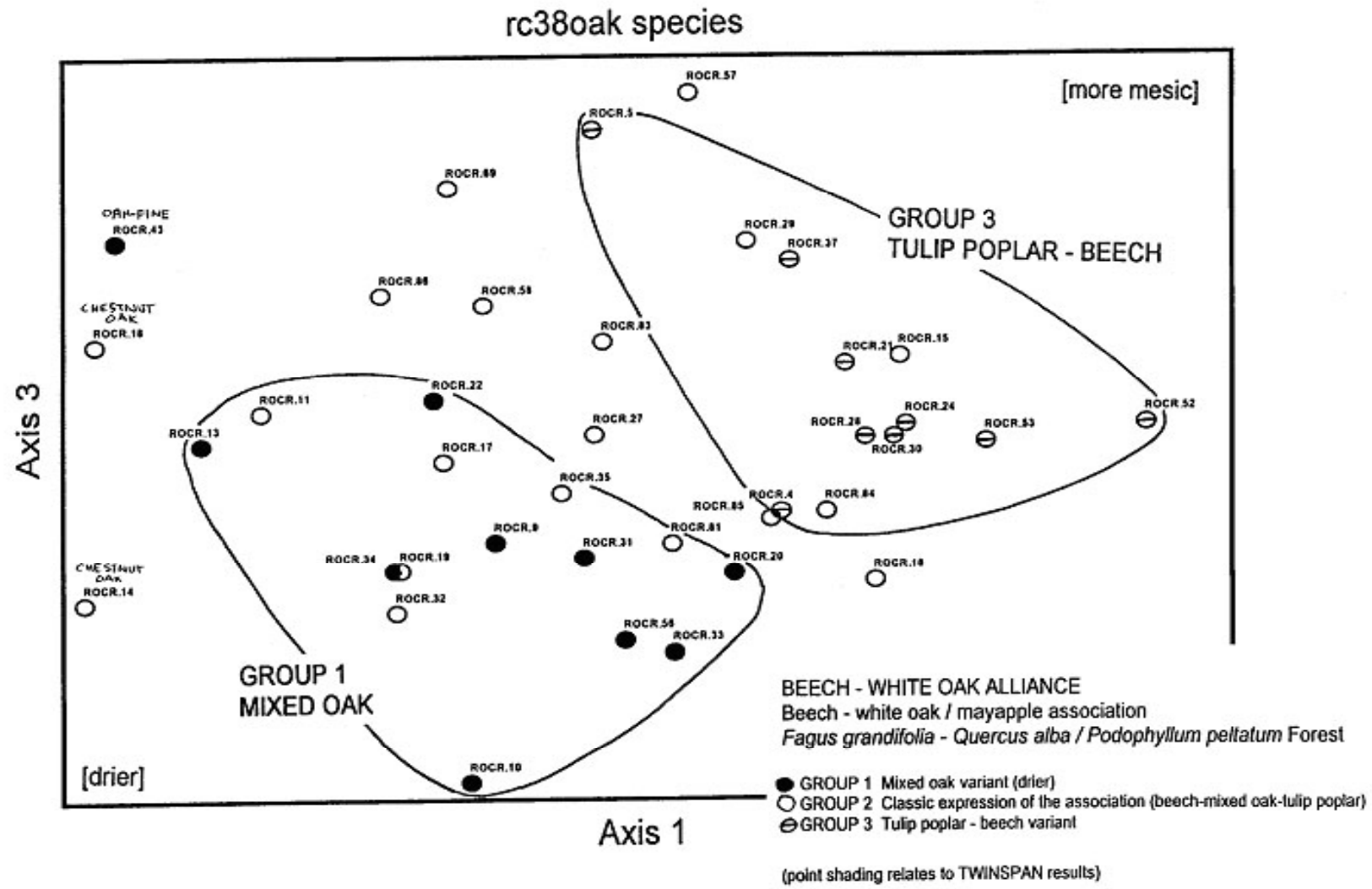
A. Quercus prinus – Nyssa Group

B. Pinus taeda – Prunus serotina Group

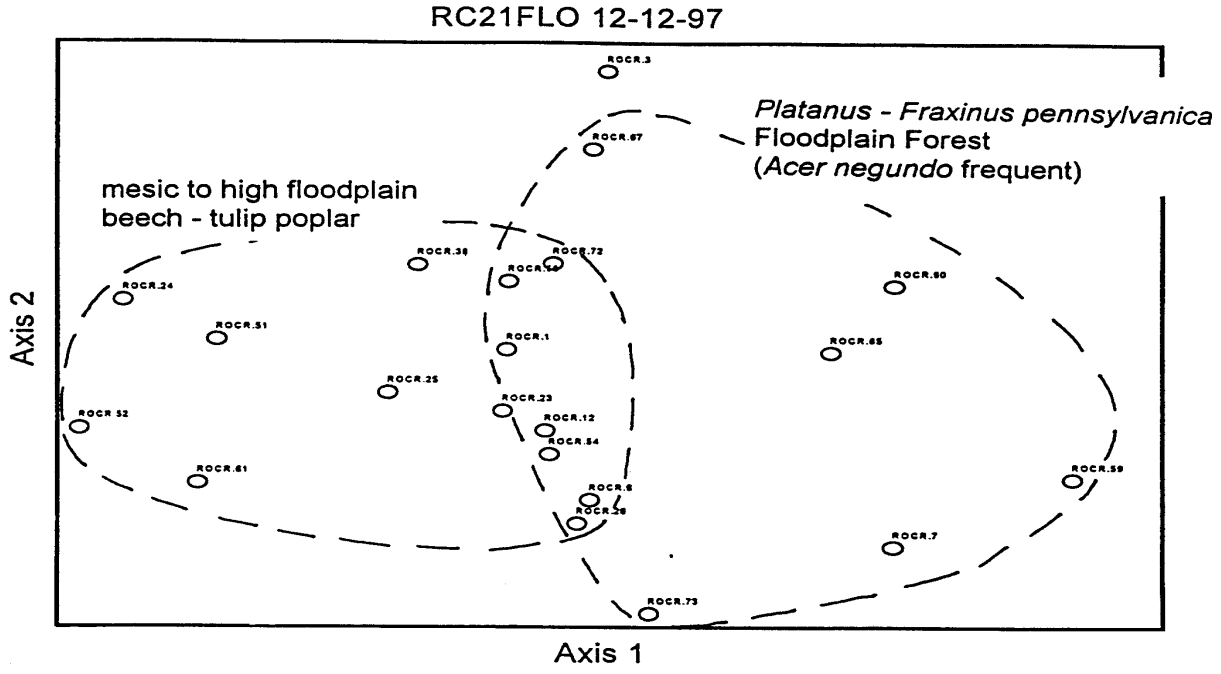
C. Quercus alba – Fagus Group
   C′ mixed Group; includes misassigned plots that fit with Group B
   C″ Quercus alba – Fagus with Viburnum acerifolium and Linera benzoin

D. Liriodendron – Acer negundo Group
   D′ with prevalent Fagus component
   D″ Platanus prevalent; Fagus absent

Appendix B. Detrended Correspondence Analysis (DCA) of 38 mixed oak forest plots.
Interpretation of groupings partially derived from TWINSPAN analysis on these plots.



Appendix C. DCA Analysis of 21 mesic or floodplain tulip poplar-beech-mixed oak forest. Includes plots from Group D and mesic end of group C" in Appendix A.



Appendix D. List of Plots and Corresponding Vegetation Associations

Plot Code	Air Photo Number	Vegetation Association
ROCR.1	09-17	Platanus occidentalis - Fraxinus pennsylvanica Forest
ROCR.2	09-09	Quercus (prinus, velutina) / Gaylussacia baccata Forest
ROCR.3	10-17	Liriodendron tulipifera Forest
ROCR.4	09-17	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.5	09-17	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.6	10-15	Platanus occidentalis - Fraxinus pennsylvanica Forest
ROCR.7	10-15	Platanus occidentalis - Fraxinus pennsylvanica Forest
ROCR.8	09-09	Quercus (prinus, velutina) / Gaylussacia baccata Forest
ROCR.9	09-09	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.10	09-09	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.11	09-11	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.12	10-17	Platanus occidentalis - Fraxinus pennsylvanica Forest
ROCR.13	09-11	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.14	09-11	Quercus (prinus, velutina) / Gaylussacia baccata Forest
ROCR.15	09-09	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.16	09-09	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.17	09-17	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.18	10-11	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.19	09-11	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.20	10-15	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.21	10-15	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.22	09-13	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.23	10-16	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.24	10-15	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.25	10-15	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.26	10-15	Platanus occidentalis - Fraxinus pennsylvanica Forest
ROCR.27	09-13	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.28	09-13	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.29	09-13	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.30	09-17	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.31	09-07	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.32	09-07	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.33	07-05	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.34	07-05	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.35	09-11	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.36	10-15	Unassigned
ROCR.37	09-17	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.38	09-13	Liriodendron tulipifera Forest
ROCR.41	11-13	Pinus taeda - Quercus (alba, falcata, stellata) Forest
ROCR.43	12-01	Pinus taeda - Quercus (alba, falcata, stellata) Forest
ROCR.44	12-01	Pinus taeda - Quercus (alba, falcata, stellata) Forest
ROCR.45	12-01	Pinus taeda - Quercus (alba, falcata, stellata) Forest
ROCR.46	12-01	Pinus taeda - Quercus (alba, falcata, stellata) Forest
ROCR.47	12-01	Pinus taeda - Quercus (alba, falcata, stellata) Forest
ROCR.48	12-01	Quercus (prinus, velutina) / Gaylussacia baccata Forest

ROCR.49	12-01	Quercus (prinus, velutina) / Gaylussacia baccata Forest
ROCR.51	05-04	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.52	05-04	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.53	05-04	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.54	05-04	Platanus occidentalis - Fraxinus pennsylvanica Forest
ROCR.55	05-02	Platanus occidentalis - Fraxinus pennsylvanica Forest
ROCR.56	05-02	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.57	09-13	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.58	09-13/15	Rubus allegheniesis / Ampelopsis brevipedunculata Shrubland
ROCR.59	02-04	Platanus occidentalis - Fraxinus pennsylvanica Forest
ROCR.60	10-13	Platanus occidentalis - Fraxinus pennsylvanica Forest
ROCR.61	04-03	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.62	04-03	Liriodendron tulipifera Forest
ROCR.65	10-13	Platanus occidentalis - Fraxinus pennsylvanica Forest
ROCR.66	10-17	Unassigned
ROCR.67	10-11	Platanus occidentalis - Fraxinus pennsylvanica Forest
ROCR.69	10-13	Unassigned
ROCR.70	10-13	Unassigned
ROCR.71	13-15	Unassigned
ROCR.72	10-13	Platanus occidentalis - Fraxinus pennsylvanica Forest
ROCR.73	09-17	Platanus occidentalis - Fraxinus pennsylvanica Forest
ROCR.74	09-07	Unassigned
ROCR.77	09-11	Unassigned
ROCR.78	09-11	Unassigned
ROCR.79	09-11	Unassigned
ROCR.80	09-07	Unassigned
ROCR.81	09-09	Pinus virginiana - Quercus (alba, stellata, falcata, velutina) Forest
ROCR.82	09-09	Unassigned
ROCR.83	09-13	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest
ROCR.84	10-13	Pinus virginiana - Quercus (alba, stellata, falcata, velutina) Forest
ROCR.85	10-13	Pinus virginiana - Quercus (alba, stellata, falcata, velutina) Forest
ROCR.86	09-11	Fagus grandifolia - Quercus alba / Podophyllum peltatum Forest