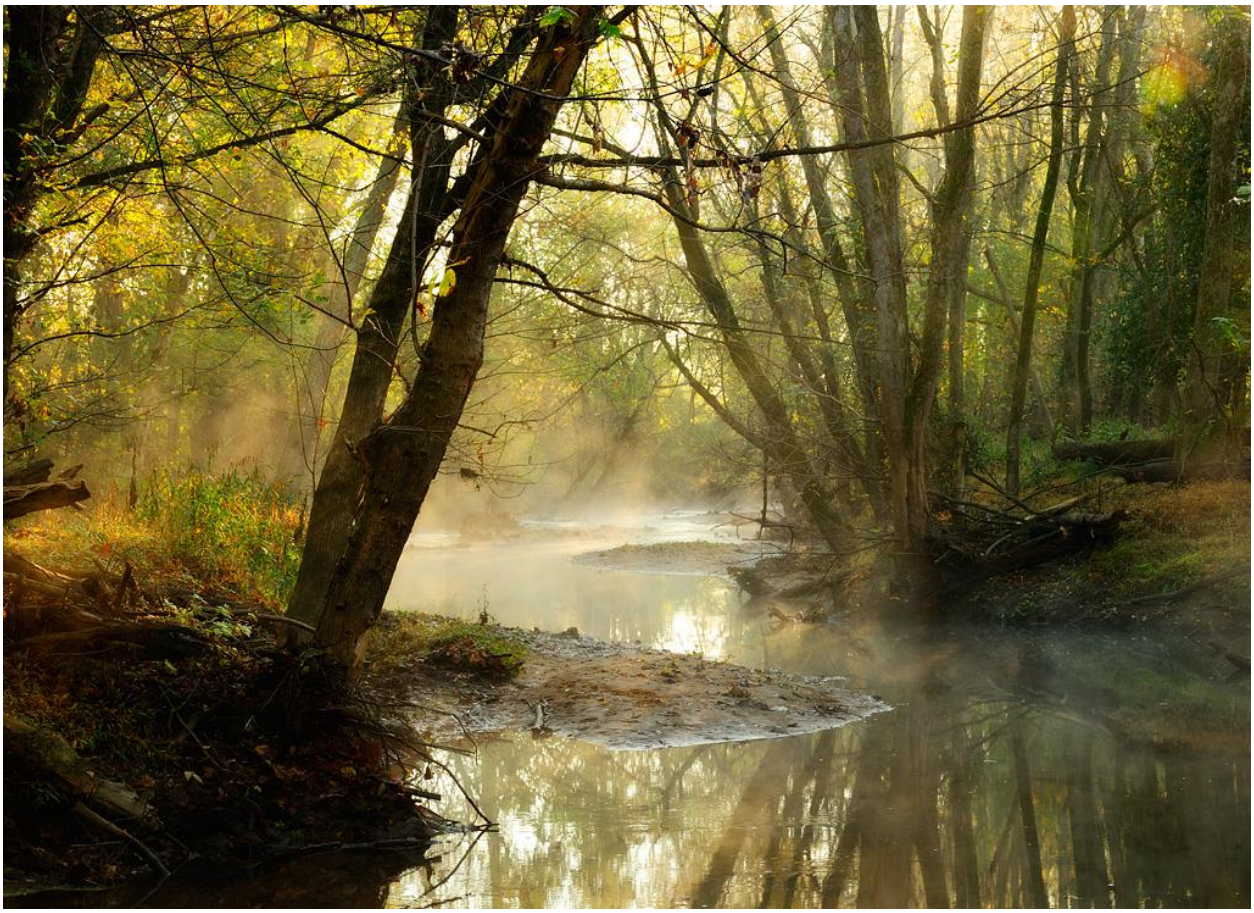
Native Plant Studies Certificate Project

Gardening by Natural Community:

Using Local Communities to Guide Plant Selection and Garden Design



Alluvial Forest, Morgan Creek at Mason Farm Biological Reserve (Photo by David Blevins, Ph.D.)

Submitted by Angela Horne
June 28, 2013

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Gardening by Natural Community:

Using Local Communities to Guide Plant Selection and Garden Design

*"In the past we have not designed gardens that play a critical ecological role in the landscape, but we **must** do so in the future. **The importance of our doing this cannot be overstated**. We need to quickly replace unnecessary lawn with densely planted woodlots in the East and West, and natural prairies in the Midwest; whatever can serve as habitat for our local biodiversity" (Doug Tallamy).*

Project Description

Objective: Develop content for a webpage that assists home gardeners in creating native gardens based on local natural communities.

The goal of the project is to promote gardening within nature's context. An online tool will help gardeners identify their local natural communities, provide a palette of native plants by natural community, map accessible natural areas to visit, and link to recommended native plant sources.

Background Information and Method:

1. Reviewed key soil series information for Orange County. *Attachment 1*
2. Reviewed key natural community information for Orange County. *Attachment 2*
3. Linked natural communities to Orange County major rock type. *Attachment 3*
4. Linked soil series to natural communities (multiple iterations). *Attachment 4*
5. Compiled plant lists by natural community. *Attachment 5*
6. Reviewed and mapped accessible natural areas of Orange County. *Google map*
7. Worked with web designer to develop page content. *Natural Communities page*
8. Proposed flora updates. *Attachment 6*

Discussion:

Project work occurred in two distinct phases. Early work, late 2010 through June of 2012, involved the identification, compilation, and review of existing natural community-related information. The second effort, July to October of 2012, entailed working collaboratively with a web designer to adapt project detail to user-friendly web content.

Information gathering and analysis

The first phase began with accessing soil data for Orange County from the Web Soil Survey (*Attachment 1*). Schafale and Weakley's *3rd Approximation* was then used to gather information on soil series, flora and places to visit by natural community. Plot summary data from the Carolina Vegetation Survey (*Attachment 2*) and the March 2012 release of the *4th Approximation* were reviewed to update initial soil series (*Attachment 4*) and flora detail (*Attachment 5*). The 2004 *Inventory of Natural Areas and Wildlife Habitats for Orange County* guided expansion of the list of accessible local places to visit (*Google map*).

Webpage development

The second phase of the project involved gaining approval for inclusion on the new Orange County Extension Master Gardener Volunteer website. The site, developed for a broad audience, aims to provide research-based horticultural and environmental information of interest to anyone who gardens in Orange County or adjacent areas.

In developing the natural community page, we sought to make information accessible on varying levels, depending on the interest and expertise of the viewer. The page content is structured to build from broad concepts to more specific detail. Brevity was an important factor in narrative development and we tried to make liberal use of graphics and photos. (A pictorial overview of the natural communities' page organization and key features follows the discussion section.)

Flora updates

Attachments 6a - 6l reflect proposed updates to the webpage plant lists by community. The attached lists attempt to better convey a sense of abundance by community, as well as, add plants of horticultural interest. Species are listed in descending constancy order (sourced from CVS constancy tables), with adjustments made to try and correctly reflect spring ephemerals' abundance and align dominant trees with *4th Approximation* community descriptions.

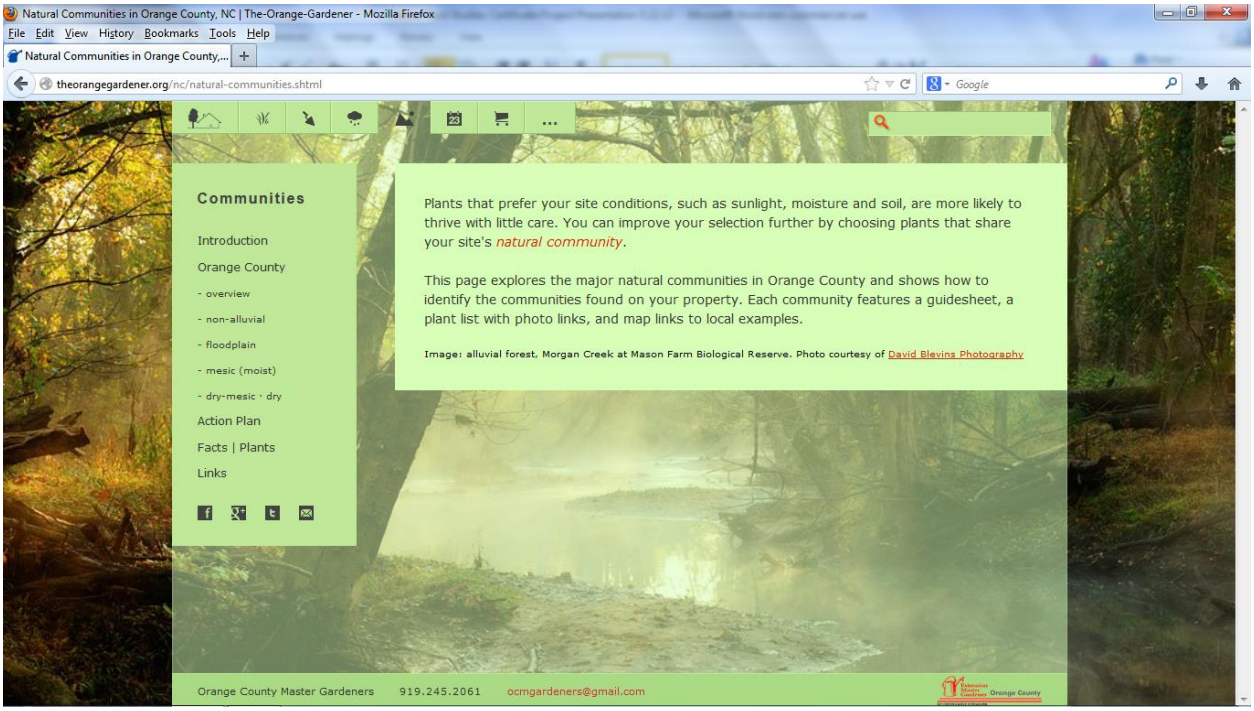
Methodology:

- Created initial list of plants by community from Schafale & Weakley's *3rd Approximation*.
- Updated the list with information from the *4th Approximation*, 3/12. (This is the plant information currently on the website.)
- Reviewed abundance information on the Carolina Vegetation Survey site by community sorted to 40% constancy, 10/12 and then, for all plants, 1/13.
- Reviewed and added plants, abundance information from Spira's *Wildflowers & Plant Communities,* 2/13.
- Reviewed and added plants from NCBG's 2012 fall plant sale and 2013 seed lists, 2/13.
- Reviewed abundance information for Orange County on Cook's Trees, Shrubs, and Woody Vines website, 2/13.
- Proposed updates to plant lists out for review, 3/13.

Once the plant lists are reviewed and finalized, the webpages will be updated to distinguish the three proposed abundance categories by color - abundant, moderately abundant and occasional to locally abundant. Each category will be listed in alphabetical, not descending constancy, order.

Webpage - http://theorangegardener.org/nc/natural-communities.shtml

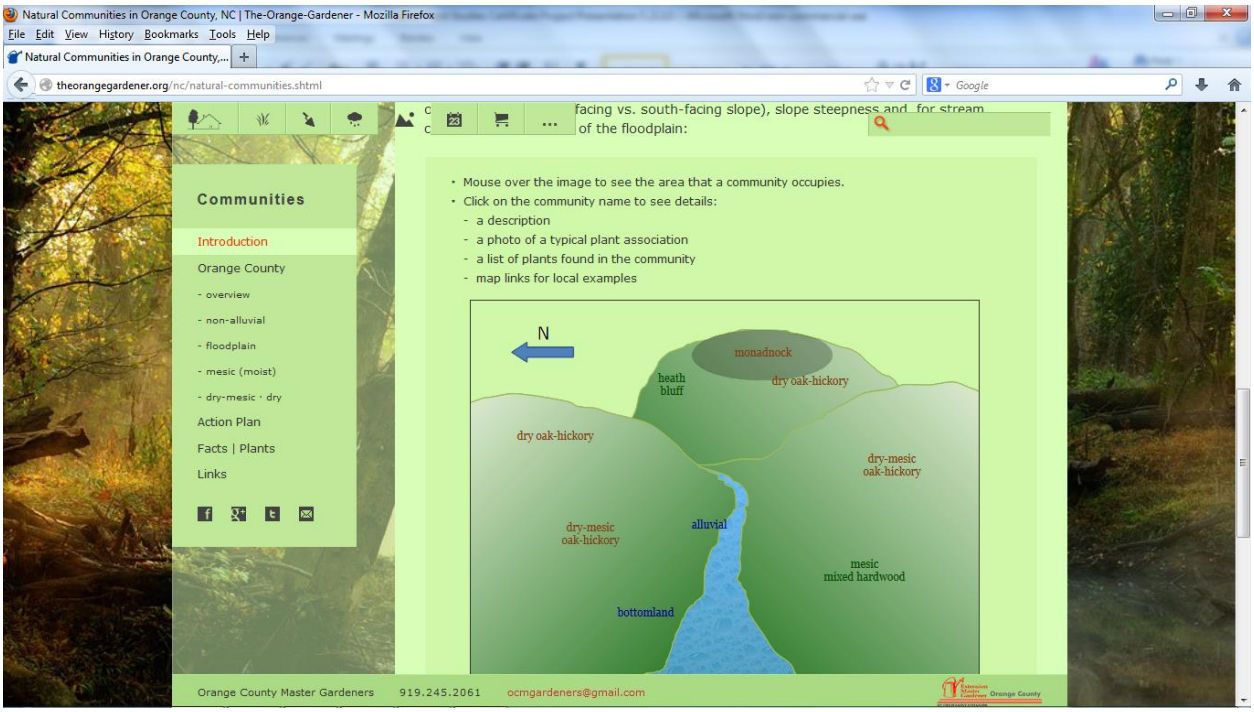
Organization



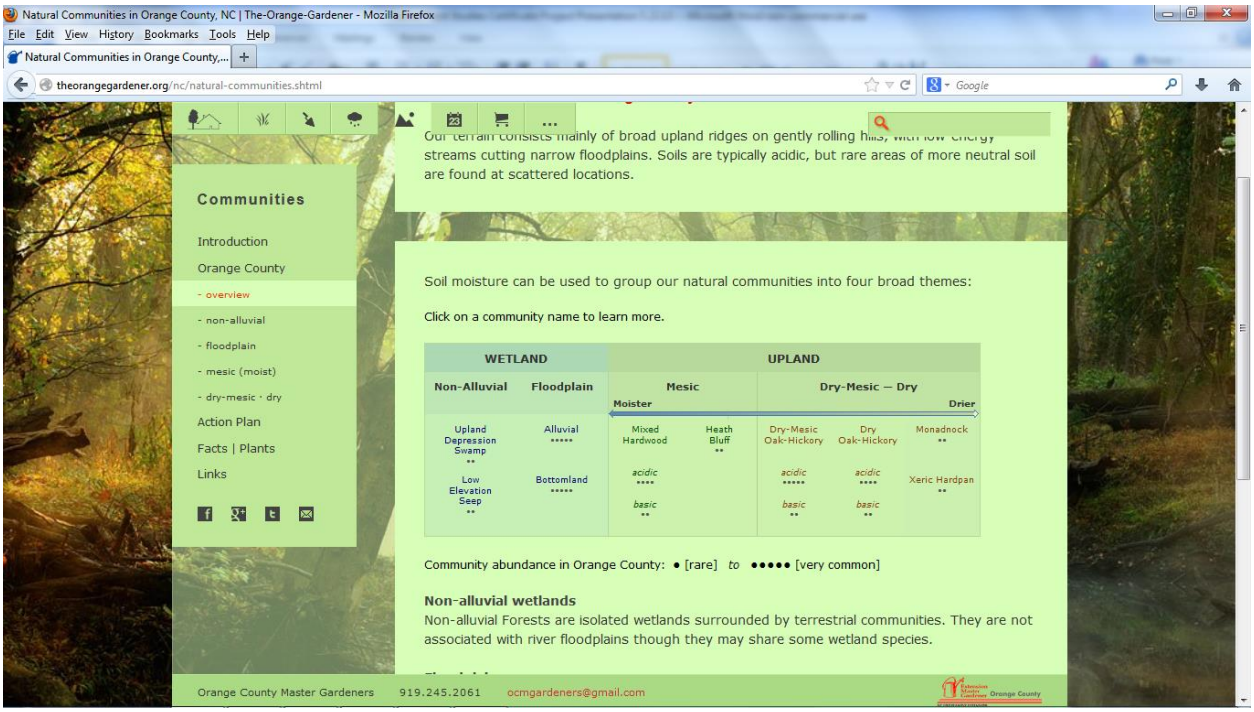
- Introduction – discusses conceptual definition, classification and significance of natural communities; simple community landscape graphic; sources
- Orange County Overview - uses soil moisture to group thirteen communities into four broad themes – non-alluvial, floodplain, mesic, dry-mesic to dry - noting relative abundance
- Orange County Communities – natural community detail within each theme includes a description, photo, printable plant list with photo links, printable guidesheet, and map of local natural areas with linked website and trail map information
- Action Plan – guided approach to identifying natural community by soil series with common plants for each community linked to photos and additional information
- Facts/Plants – quick access to all community plant lists, guidesheets, and CVS data by natural community
- Links

Key Features

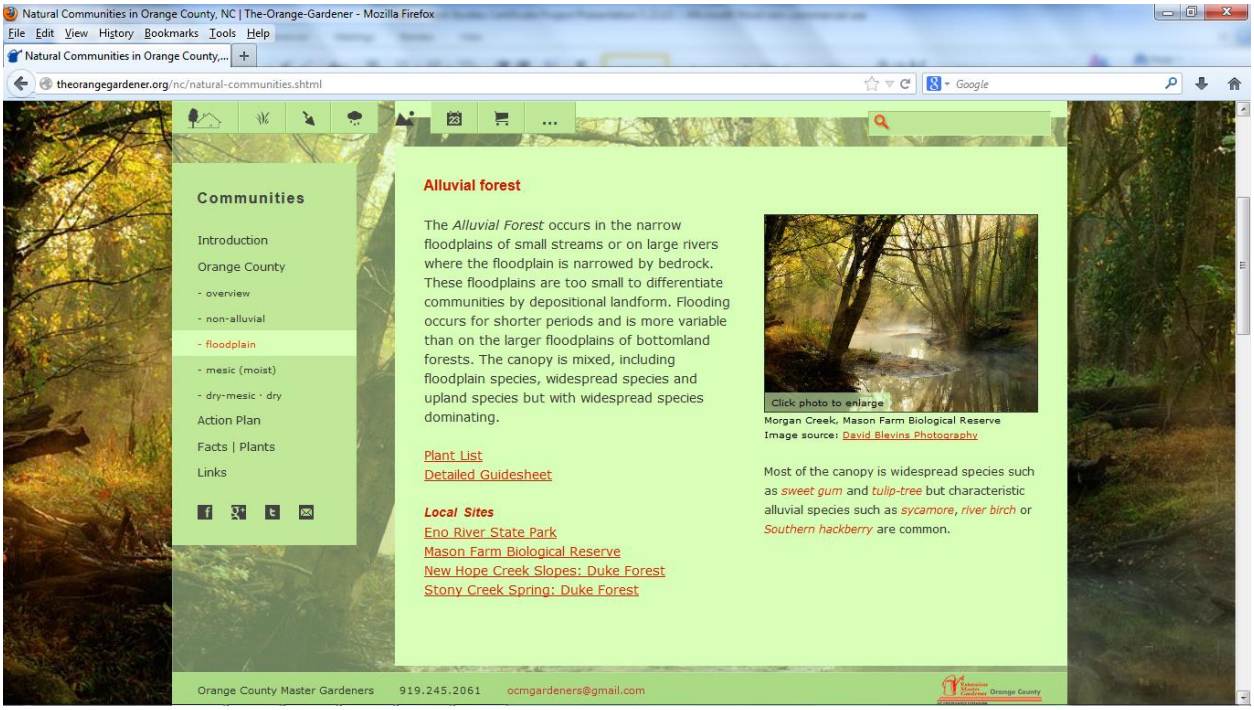
Landscape graphic – quick estimate of community by landscape position



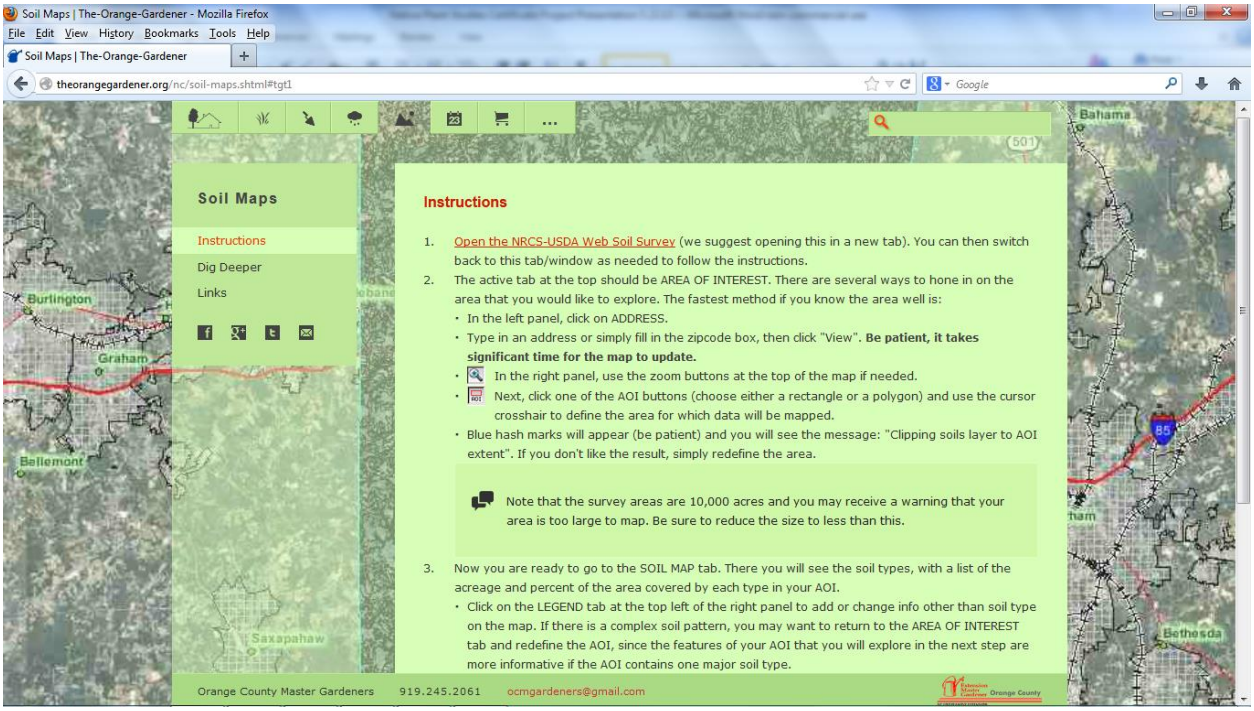
Themes graphic – communities grouped by soil moisture with OC relative abundance



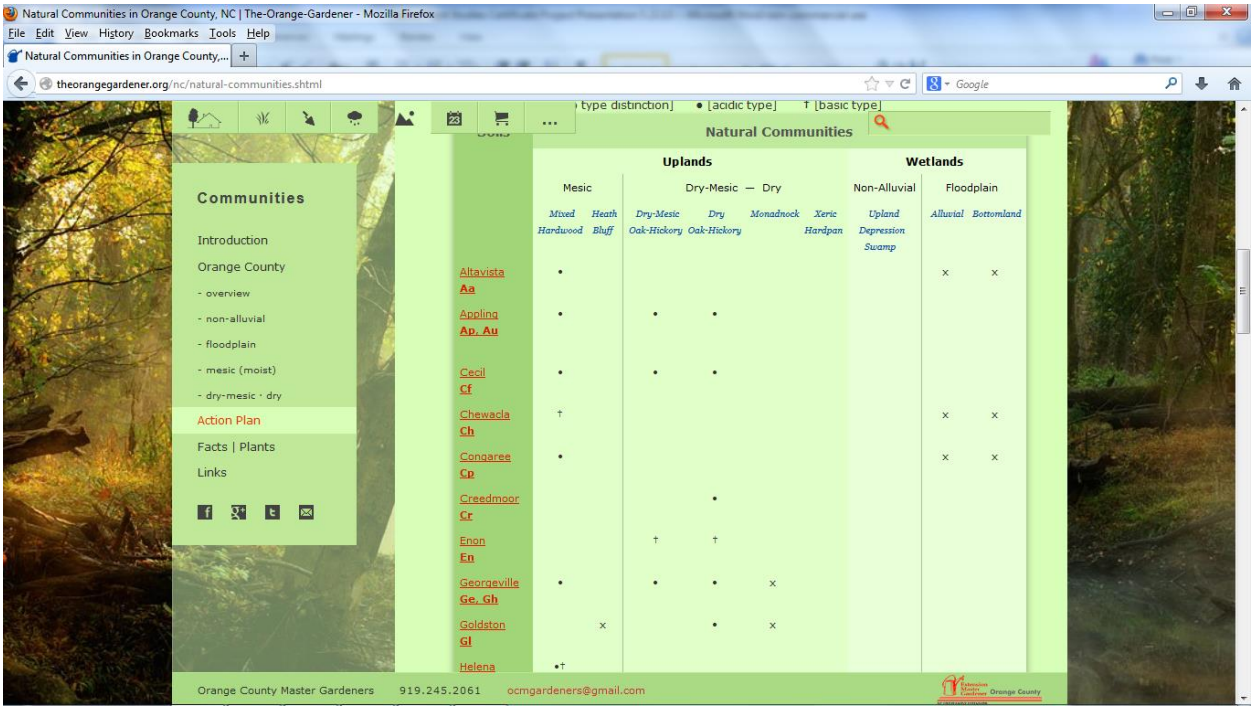
Blevins' photos – high resolution, local images of common OC communities



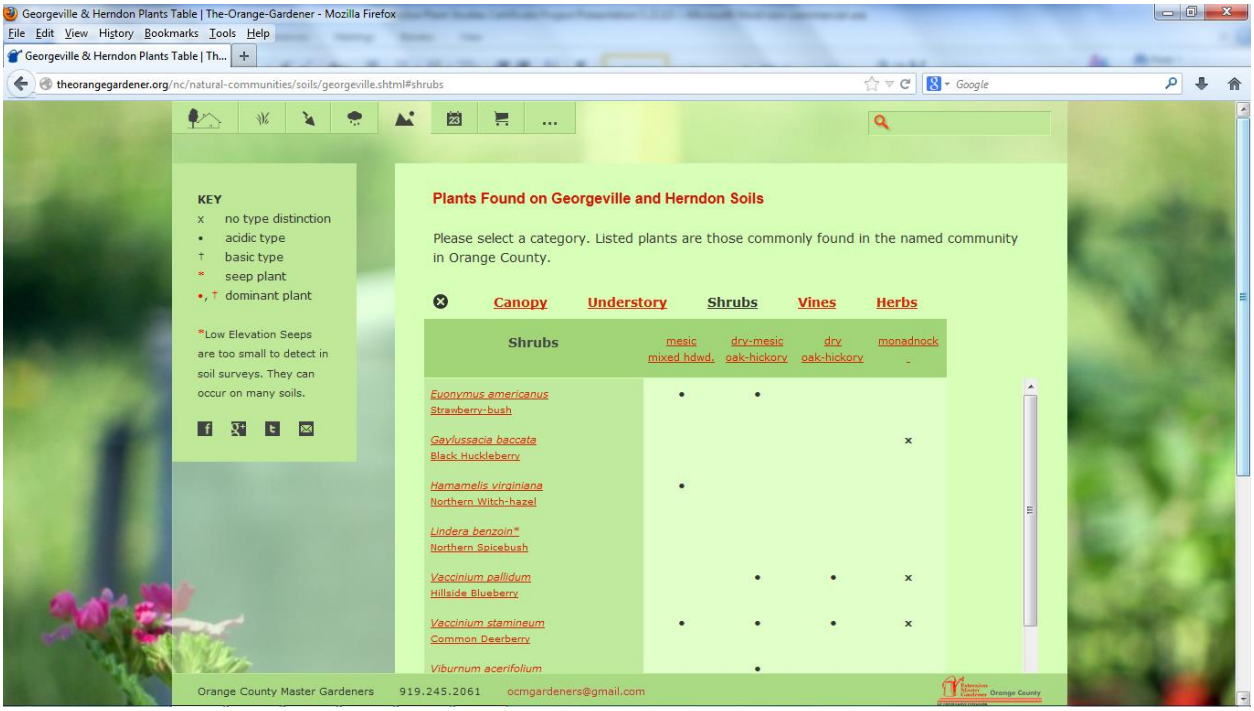
Guided soil map instructions – uses Web Soil Survey to determine soil series by address



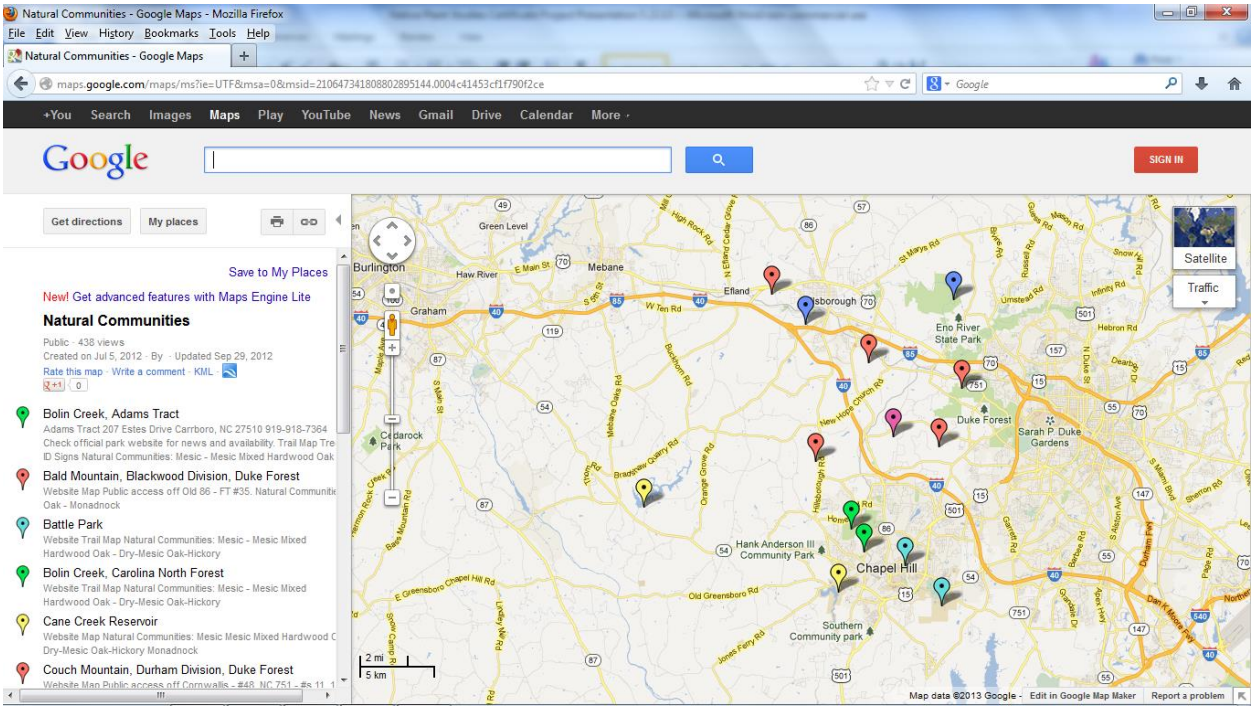
Soils table - links soil series to associated natural communities and common plant species



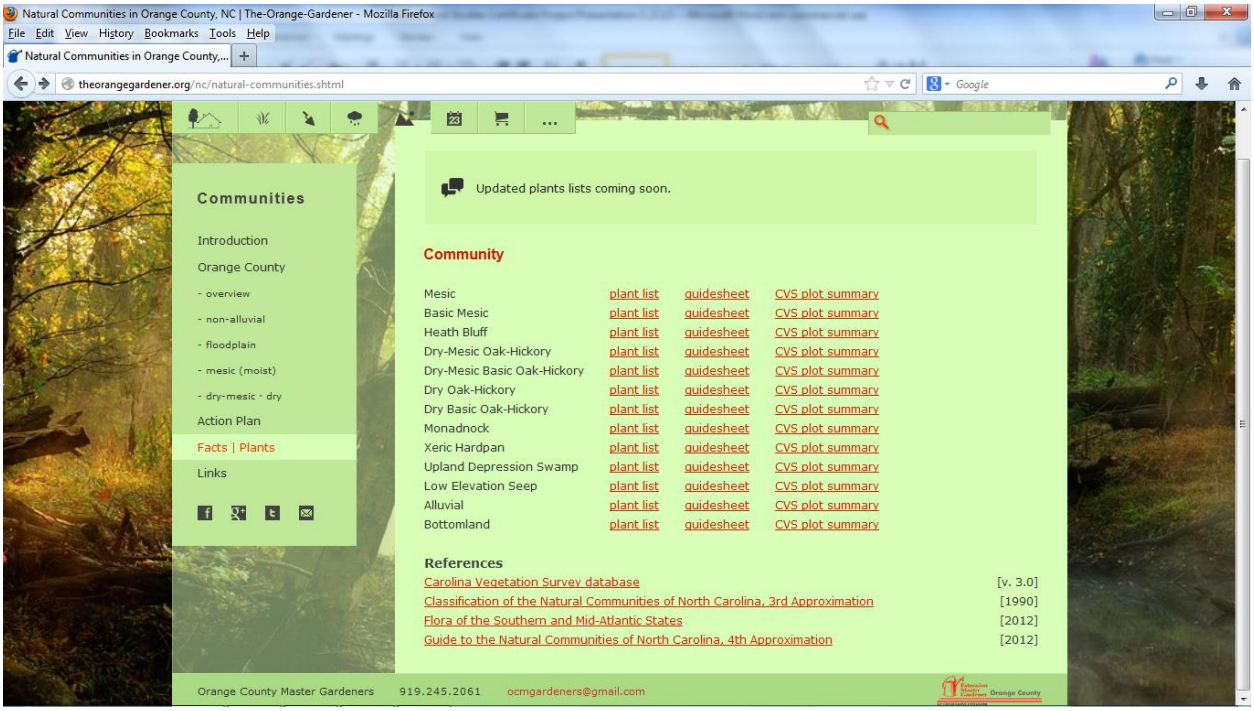
Plants tables – lists plants commonly found in the named OC community (by soil series)



Map of local natural areas – website, trail map, and community info (where available)



Facts/Plants page – quick access to all plant lists, guides, and CVS info



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Tallamy, Doug. "Gardening for Life." *Wild Ones Journal* 22.2 (2009): 8-9. Print.

Weakley, Alan S. *Flora of the Southern and Mid-Atlantic States*. Chapel Hill, NC: UNC Herbarium, North Carolina Botanical Garden, University of North Carolina at Chapel Hill, 2012. Print.

"Web Soil Survey." *Web Soil Survey - Home*. Web. 26 May 2012. <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>.

Acknowledgements

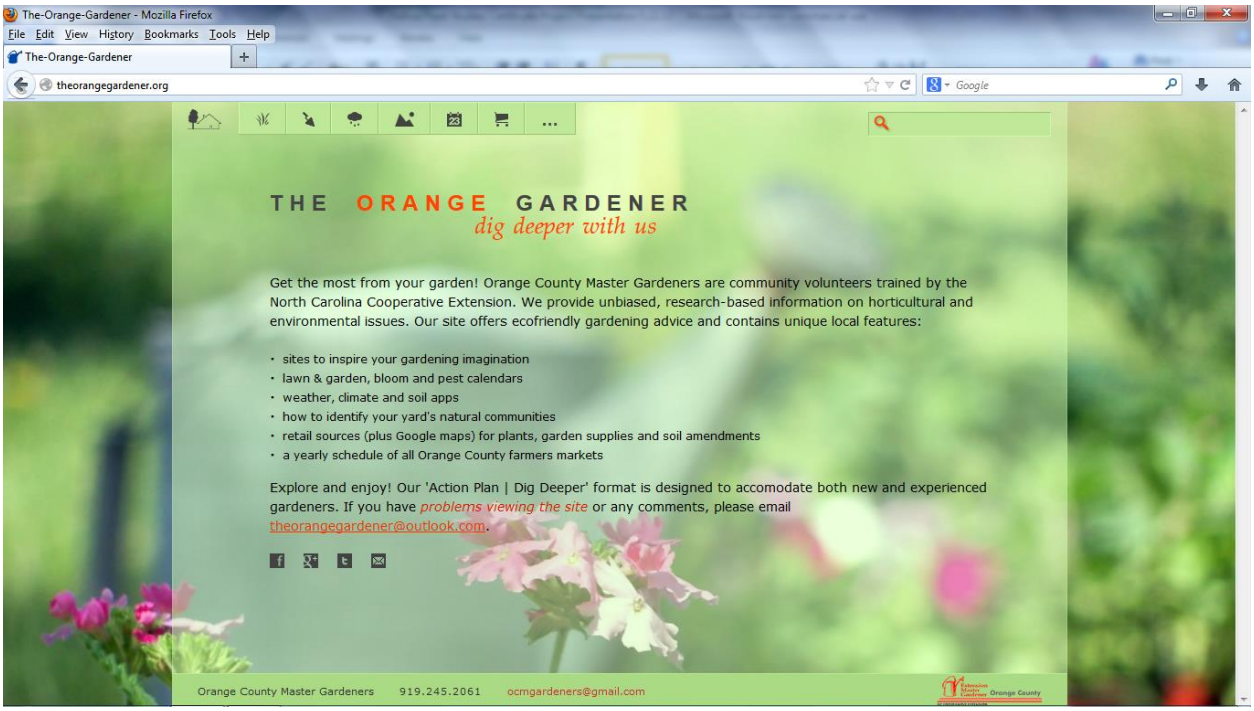
Thank you to Nicolette Cagle who has mentored this project and generously donated her time and expertise.

Many thanks to master gardener colleague, Leigh Simpson, for tirelessly, and with good humor, working to translate project detail to interactive webpage content. Thanks also to Carl Matyac, County Extension Director, Orange County Center, for approving inclusion on the larger OCMG website.

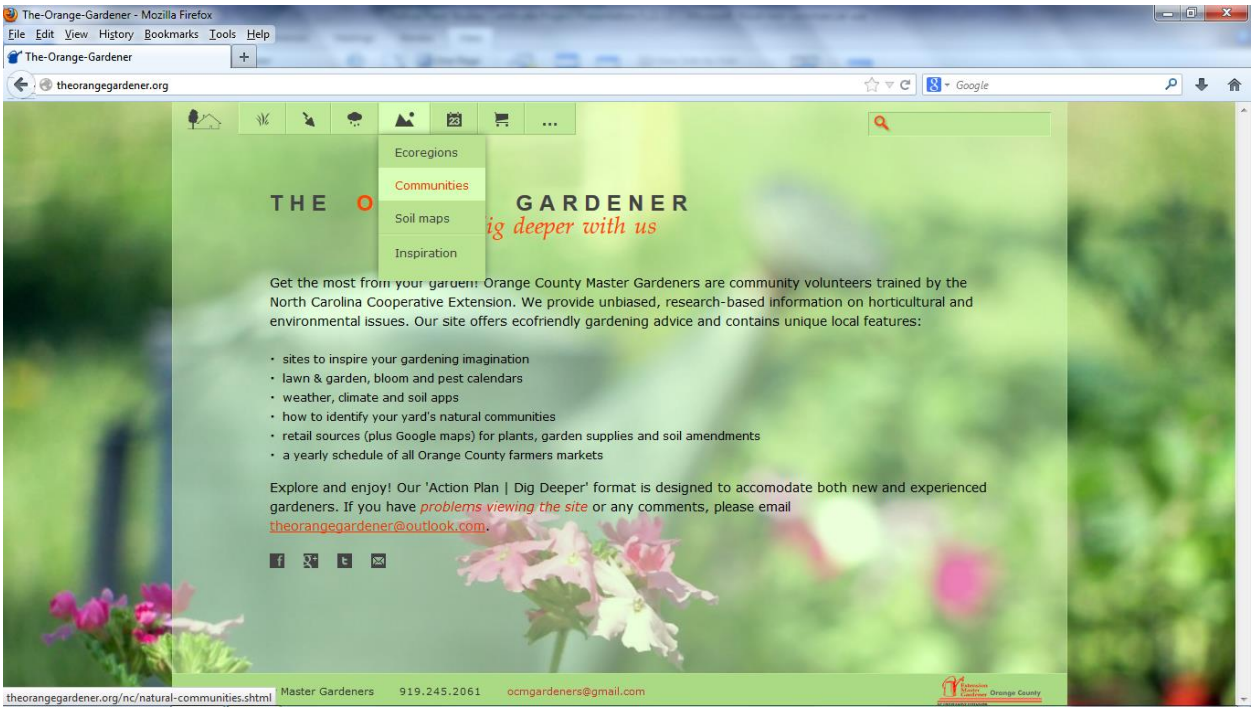
Thank you to Alan Weakley of the UNC Herbarium for review of and feedback concerning webpage content.

Finally, I would like to thank David and Adam Catrambone for their willingness to review and provide constructive feedback throughout the process.

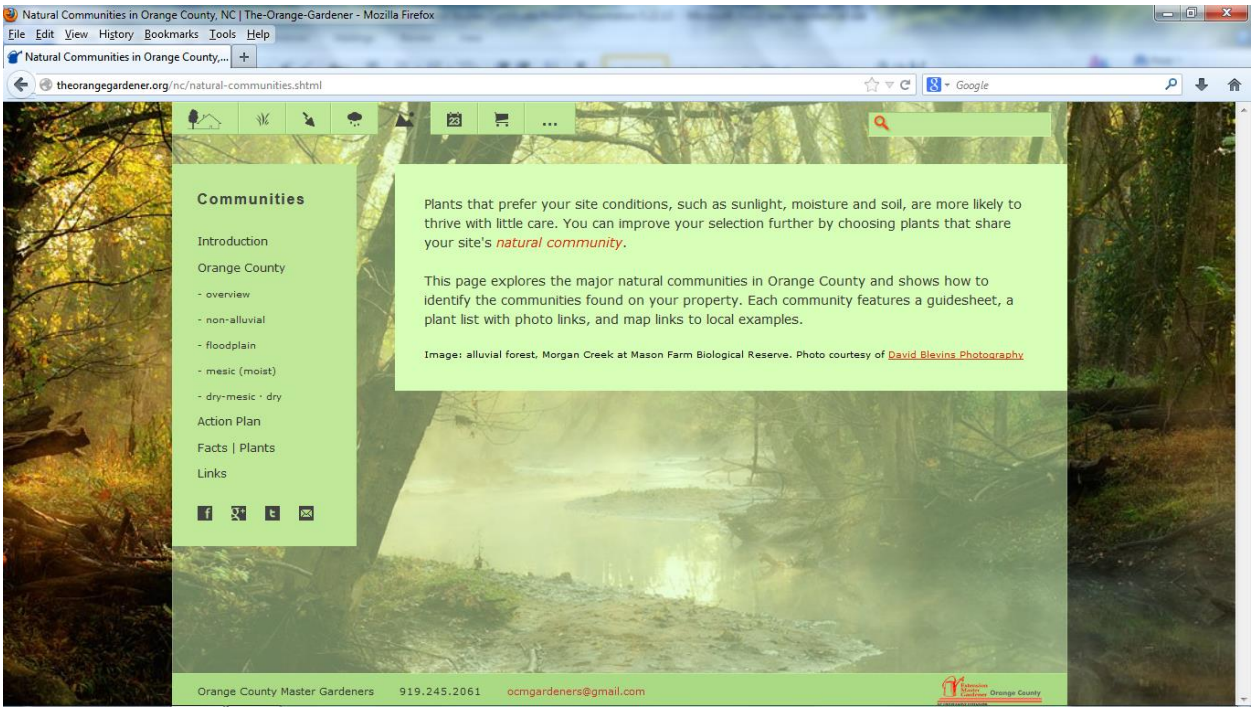
Appendix - http://theorangegardener.org/



Navigate to Natural Communities page

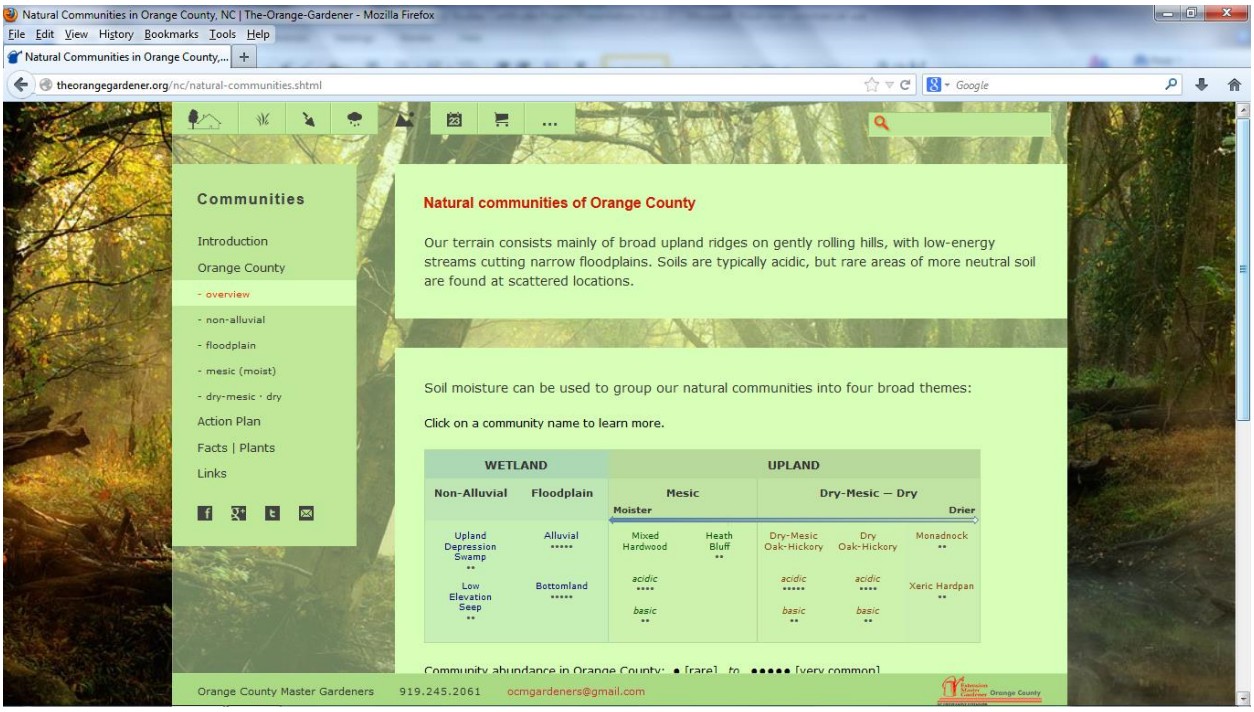


Natural Communities landing page

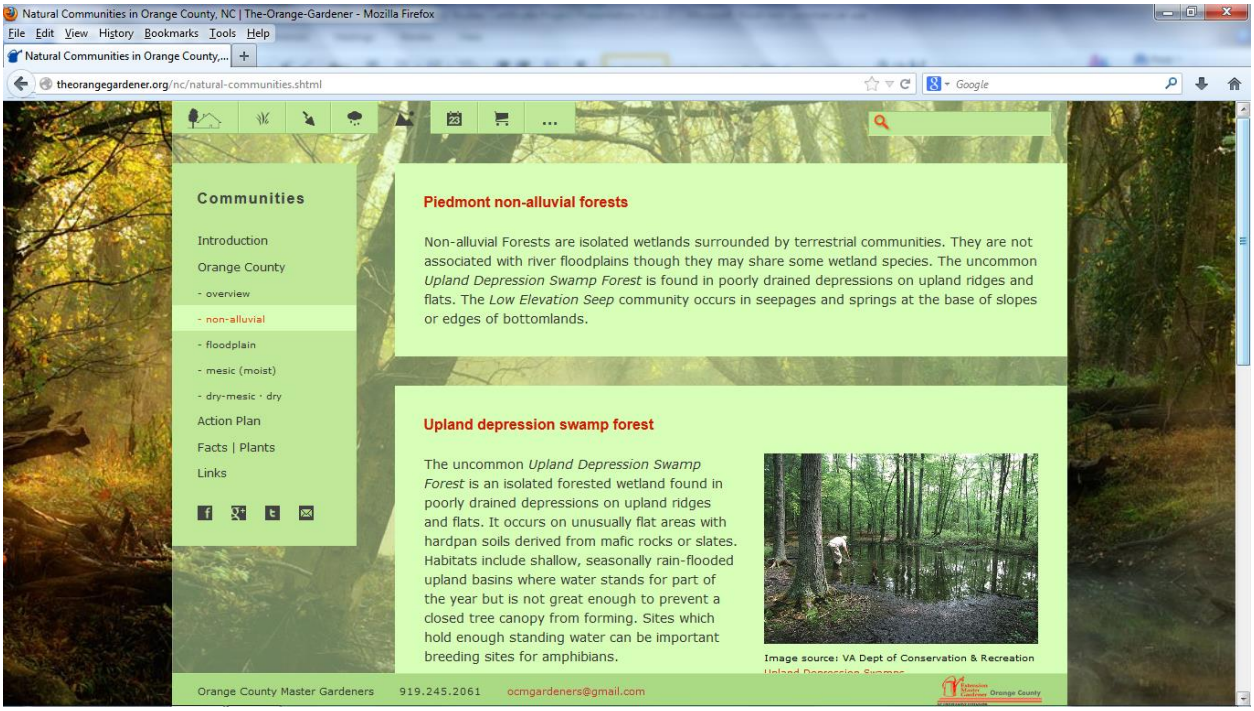


Introduction

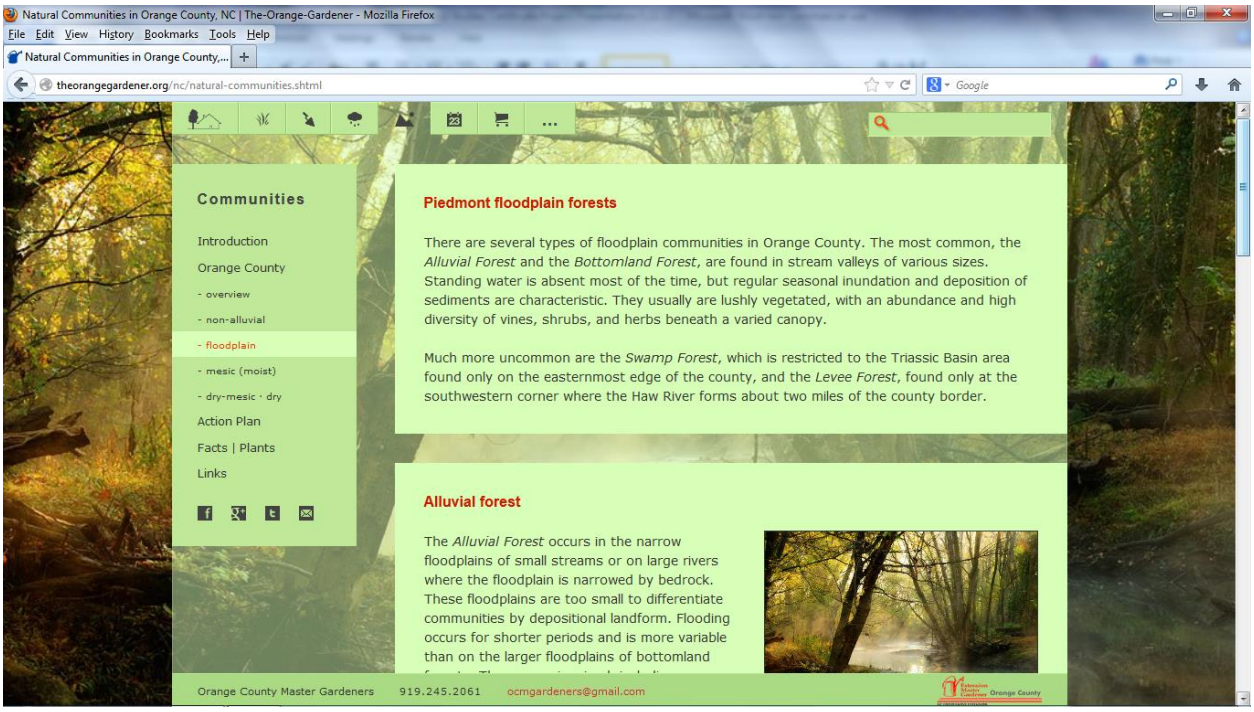
Overview



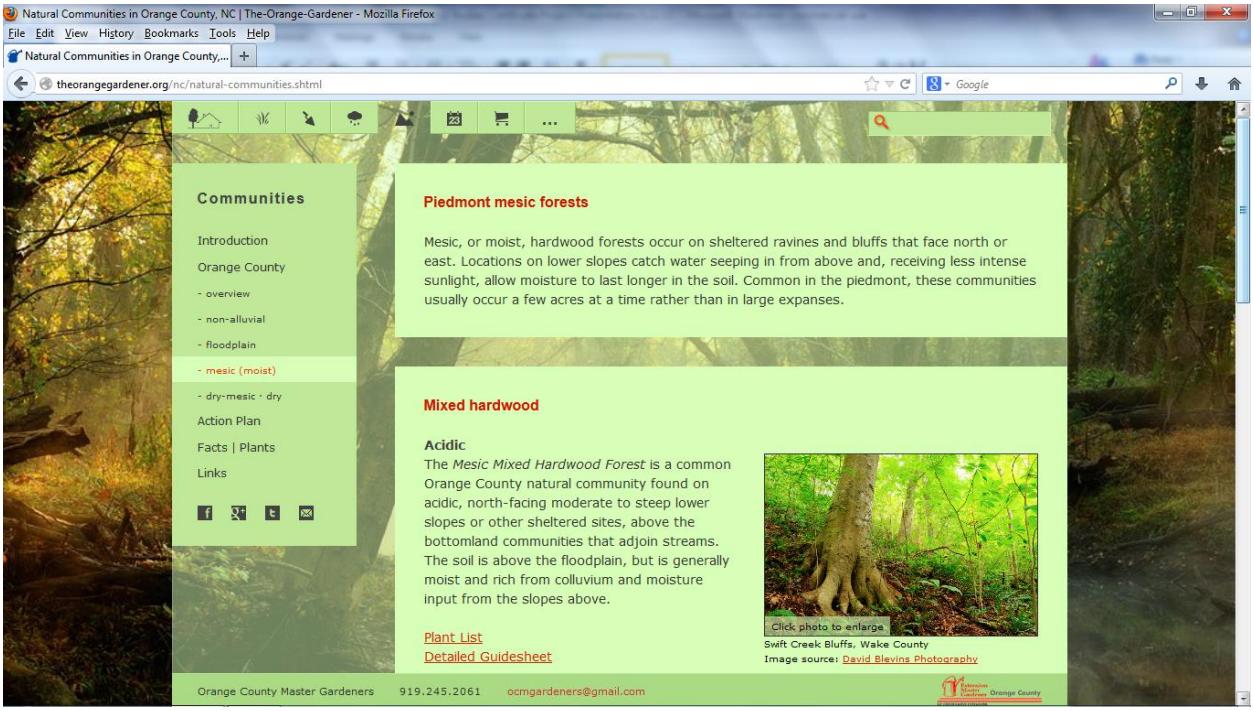
Non-alluvial Communities



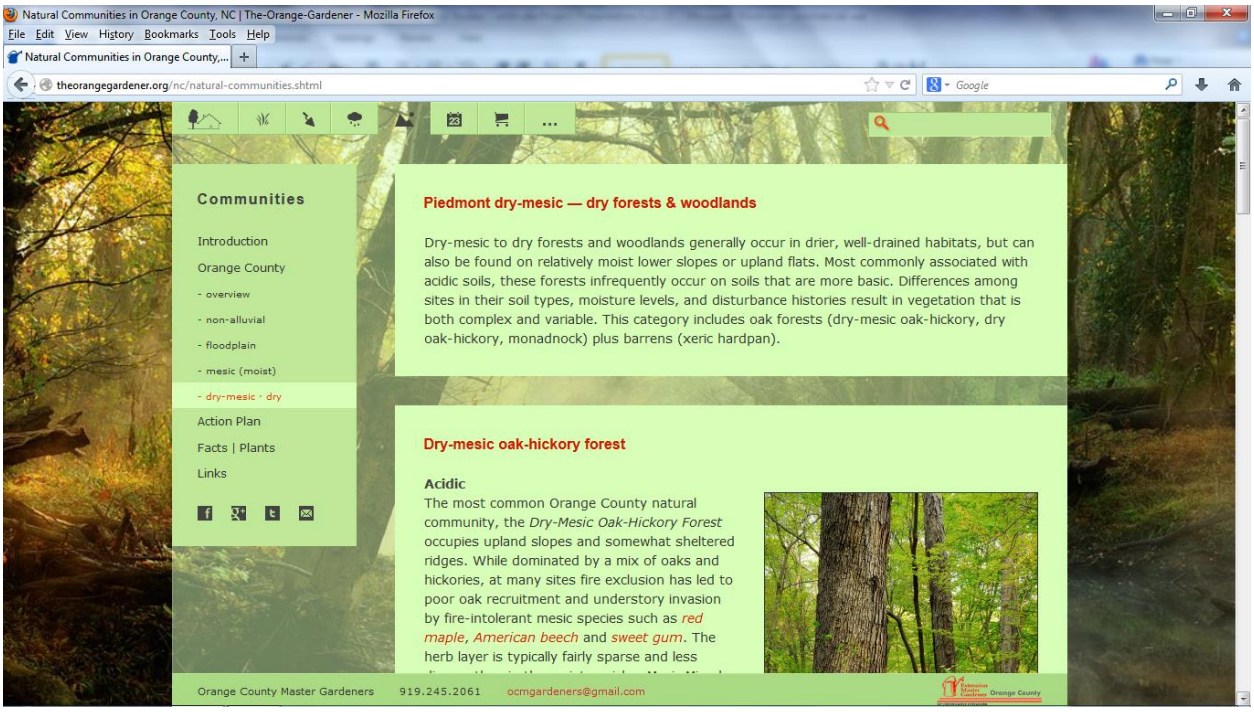
Floodplain Communities



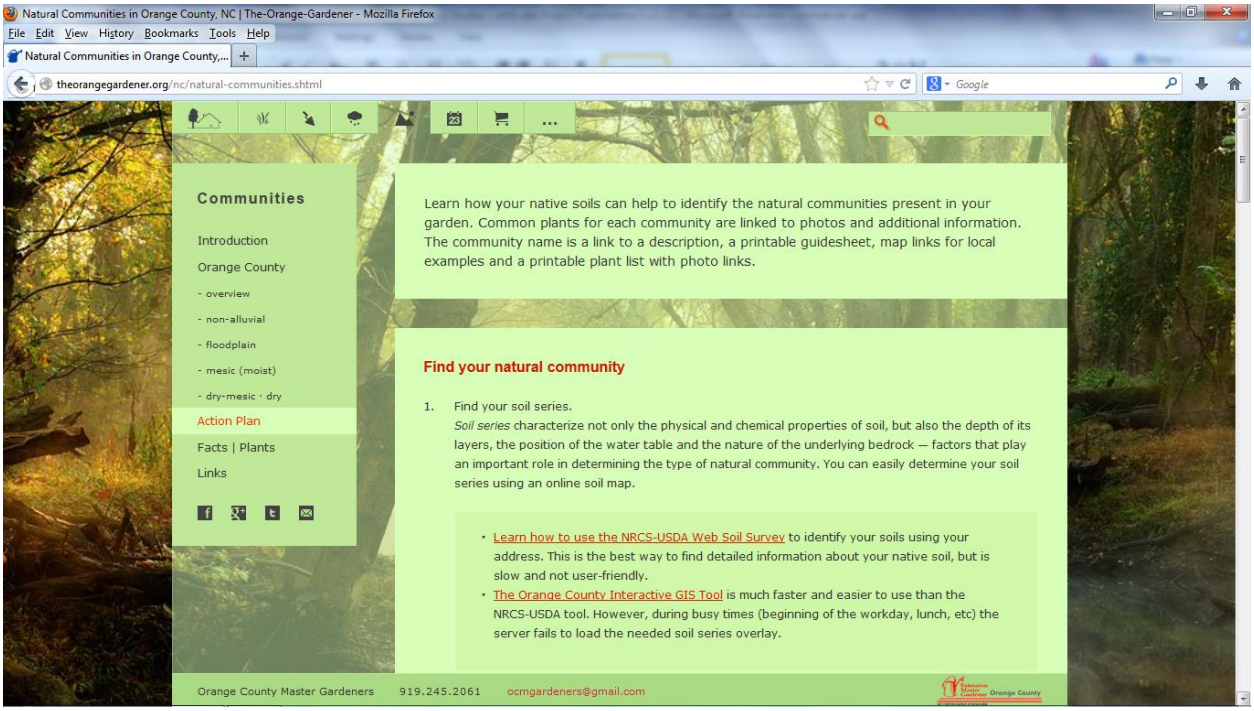
Mesic Communities



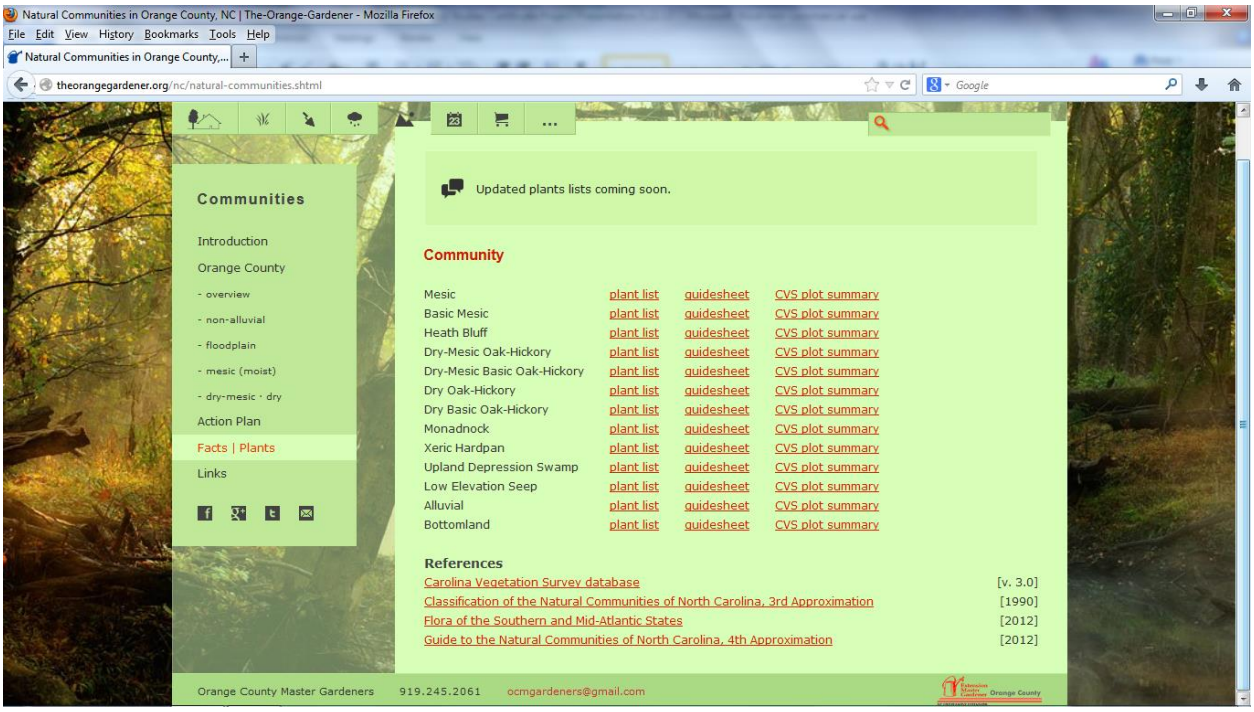
Dry-Mesic to Dry Communities



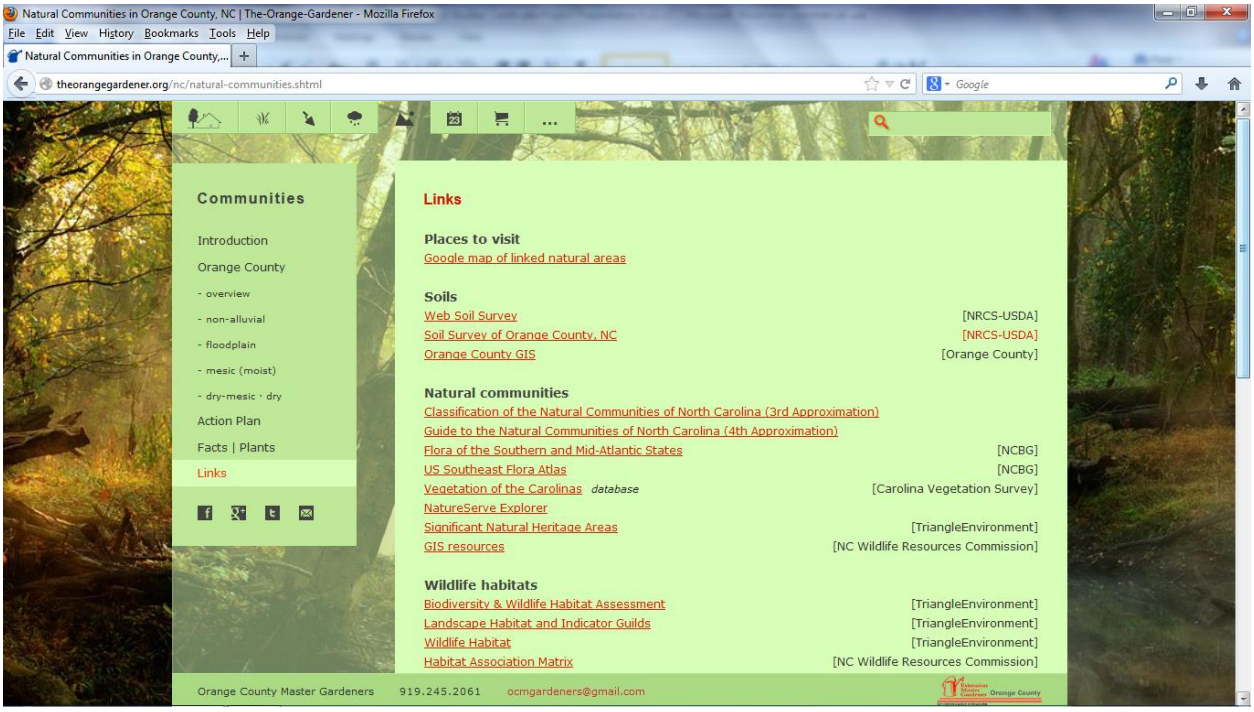
Action Plan



Facts/Plants



Links



Attachments – link to all documents

Attachment 1
Soil Properties

Soil Name	Texture	% Slope	Landform/Position	Slope Shape	Parent Material	Soil Depth (in)	Depth to Water	pH to 12 in	CEC	Acres	% Total	Soil Name	Family	Order	Notes
White Store	loam	2 - 6	interfluves/summit	convex	resid shale/silts/muds/sands	40-60	6-18	4.5 - 5.5	5.0 - 40	1,582	0.6%	White Store	Fine, mixed, active, thermic Oxyaquic Vertic Hapludalfs	Alfisols	
White Store	clay loam	6 - 15	ridges/backslope	linear/convex	resid shale/silts/muds/sands	40-60	6-18	4.5 - 5.5	5.0 - 40	1,482	0.6%	White Store	Fine, mixed, active, thermic Oxyaquic Vertic Hapludalfs	Alfisols	
White Store - Urban	complex	2 - 8	interfluves/summit	convex	resid shale/silts/muds/sands	40-60	6-18	4.5 - 5.5	5.0 - 40	598	0.2%	White Store - Urban	Fine, mixed, active, thermic Oxyaquic Vertic Hapludalfs	Alfisols	
Wilkes	gravelly loam	8 - 15	ridges/backslope	linear/convex	diorite/gabbro/diabase/gneiss	10-20	>80	5.1 - 8.4	3.6 - 31	788	0.3%	Wilkes	Loamy, mixed, active, thermic, shallow Typic Hapludalfs	Alfisols	pH 5.5 - 6.5 to 6 inches.
Wilkes	gravelly loam	15 - 45	ridges/backslope	linear/convex	diorite/gabbro/diabase/gneiss	10-20	>80	5.1 - 8.4	3.6 - 31	607	0.2%	Wilkes	Loamy, mixed, active, thermic, shallow Typic Hapludalfs	Alfisols	
Enon	loam	2 - 6	interfluves/summit	convex	diorite/gabbro/diabase/gneiss	>80	>80	5.1 - 7.8	3.1 - 31	10,048	3.9%	Enon	Fine, mixed, active, thermic Ultic Hapludalfs	Alfisols	pH to 6.5 until 11 inches.
Enon	loam	6 - 12	ridges/backslope	linear/convex	diorite/gabbro/diabase/gneiss	>80	>80	5.1 - 7.8	3.1 - 31	5,586	2.2%	Enon	Fine, mixed, active, thermic Ultic Hapludalfs	Alfisols	
Iredell	gravelly loam	1 - 4	interfluves/summit	linear	diorite/gabbro/diabase/gneiss	40-80	12-24	5.1 - 7.3	9.0 - 30	2,804	1.1%	Iredell	Fine, mixed, active, thermic Oxyaquic Vertic Hapludalfs	Alfisols	
Iredell - Urban	complex	1 - 8	interfluves/summit	linear	diorite/gabbro/diabase/gneiss	40-80	12-24	5.1 - 7.3	9.0 - 30	774	0.3%	Iredell - Urban	Fine, mixed, active, thermic Oxyaquic Vertic Hapludalfs	Alfisols	
Orange	silt loam	0 - 3	interfluves/summit	linear	residuum from monzonite/lim	40-60	12-36	5.1 - 7.3	5.8 - 22	3,143	1.2%	Orange	Fine, smectitic, thermic Albaquic Hapludalfs	Alfisols	
Cheaocla	loam	0 - 2	flood plains	concave/linear	loamy alluvium l/m	>80	6-24	4.5 - 5.5	4.8 - 18	11,546	4.5%	Cheaocla	Fine-loamy, mixed, active, thermic Fluvaquentic Dystrudepts	Inceptisols	increasing pH to 7.8 with depth.
Congaree	fine sandy loam	0 - 2	flood plains	linear	loamy alluvium l/m	>80	30-48	4.5 - 7.3	4.7 - 17	1,705	0.7%	Congaree	Fine-loamy, mixed, active, nonacid, thermic Oxyaquic Udifluvents	Entisols	pH constant range.
Georgeville - Urban	complex	2 - 10	interfluves/summit,shoulde	convex	residuum from metavol/argillite	>80	>80	4.5 - 7.3	6.0 - 16	1,553	0.6%	Georgeville - Urban	Fine, kaolinitic, thermic Typic Kanhapludults	Ultisols	
Vance	sandy loam	2 - 8	interfluves/summit	convex	saprolite granite/gneiss/schist	>80	>80	4.5 - 6.0	3.1 - 16	2,488	1.0%	Vance	Fine, mixed, semiactive, thermic Typic Hapludults	Ultisols	
Helena	sandy loam	2 - 8	ridges/summit, footslope	concave	saprolite granite/gneiss/schist	>80	18-30	3.5 - 6.5	1.8 - 16	13,589	5.3%	Helena	Fine, mixed, semiactive, thermic Aquic Hapludults	Ultisols	
Lignum	silt loam	0 - 3	interfluves/summit	convex/linear	residuum from metavol/argillite	40-60	12-30	2.0 - 7.2	3.6 - 15	8,922	3.5%	Lignum	Fine, mixed, semiactive, thermic Aquic Hapludults	Ultisols	pH 4.5 - 5.5 beyond 12 inches.
Altavista	fine sandy loam	0 - 3	stream terraces	linear	old loamy alluvium l/m	>80	18-30	4.5 - 6.5	2.5 - 13	277	0.1%	Altavista	Fine-loamy, mixed, semiactive, thermic Aquic Hapludults	Ultisols	
Helena - Sedgefield	complex	0 - 2	ridges/summit, footslope	concave	saprolite granite/gneiss/schist	>80	18-30	3.5/4.5 - 6.5	1.0 - 15	1,954	0.8%	Helena - Sedgefield	Fine, mixed, semiactive, thermic Aquic Hapludults, Fine, mixed, active,th	Ultisols	
Creedmoor	fine sandy loam	2 - 8	interfluves/summit	convex	resid shale/silts/muds/sands	72-100	18-24	4.5 - 5.5	2.9 - 9.5	775	0.3%	Creedmoor	Fine, mixed, semiactive, thermic Aquic Hapludults	Ultisols	
Wedowee	sandy loam	15 - 25	ridges/backslope	linear/convex	saprolite granite/gneiss/schist	>80	>80	3.5 - 5.5	1.6 - 8.1	2,954	1.2%	Wedowee	Fine, kaolinitic, thermic Typic Kanhapludults	Ultisols	
Wedowee	sandy loam	8 - 15	ridges/backslope	linear/convex	saprolite granite/gneiss/schist	>80	>80	3.5 - 7.3	1.6 - 8.1	3,340	1.3%	Wedowee	Fine, kaolinitic, thermic Typic Kanhapludults	Ultisols	pH 4.5 - 7.3 to 7 inches.
Cecil	fine sandy loam	2 - 6	interfluves/summit	convex	saprolite granite/gneiss/schist	>80	>80	4.5 - 6.5	1.0 - 8.1	664	0.3%	Cecil	Fine, kaolinitic, thermic Typic Kanhapludults	Ultisols	
Cecil	fine sandy loam	6 - 10	interfluves/shoulder,summ	linear/convex	saprolite granite/gneiss/schist	>80	>80	4.5 - 6.5	1.0 - 8.1	575	0.2%	Cecil	Fine, kaolinitic, thermic Typic Kanhapludults	Ultisols	
Lloyd (Hiwassee)	clay loam	2 - 6	interfluves/summit	convex	diorite/gabbro/diabase/gneiss	>80	>80	4.5 - 7.3	2.1 - 8.0	961	0.4%	Lloyd (Hiwassee)	Fine, kaolinitic, thermic Rhodic Kanhapludults	Ultisols	pH to 6.5 beyond 7 inches.
Lloyd (Hiwassee)	clay loam	6 - 10	ridges/backslope	linear/convex	diorite/gabbro/diabase/gneiss	>80	>80	4.5 - 7.3	2.1 - 8.0	332	0.1%	Lloyd (Hiwassee)	Fine, kaolinitic, thermic Rhodic Kanhapludults	Ultisols	
Georgeville	silt loam	2 - 6	interfluves/summit	convex	residuum from metavol/argillite	>80	>80	4.5 - 7.3	1.6 - 7.6	49,284	19.2%	Georgeville	Fine, kaolinitic, thermic Typic Kanhapludults	Ultisols	pH to 7.3 until 10 inches.
Georgeville	silt loam	6 - 10	ridges/summit, shoulder	linear/convex	residuum from metavol/argillite	>80	>80	4.5 - 7.3	1.6 - 7.6	31,567	12.3%	Georgeville	Fine, kaolinitic, thermic Typic Kanhapludults	Ultisols	
Tarrus (Tatum)	silt loam	8 - 15	ridges/backslope	linear/convex	residuum from metavol/argillite	40-60	>80	4.5 - 5.5	2.3 - 7.2	15,397	6.0%	Tarrus (Tatum)	Fine, kaolinitic, thermic Typic Kanhapludults	Ultisols	
Tarrus (Tatum)	silt loam	15 - 25	ridges/backslope	linear/convex	residuum from metavol/argillite	40-60	>80	4.5 - 5.5	2.3 - 7.2	7,631	3.0%	Tarrus (Tatum)	Fine, kaolinitic, thermic Typic Kanhapludults	Ultisols	
Herndon	silt loam	2 - 6	interfluves/summit	convex	residuum from metavol/argillite	>80	>80	3.5 - 6.5	1.6 - 7.1	27,150	10.6%	Herndon	Fine, kaolinitic, thermic Typic Kanhapludults	Ultisols	pH 4.5 - 6.5 until 9 inches.
Herndon	silt loam	6 - 10	ridges/summit, shoulder	linear/convex	residuum from metavol/argillite	>80	>80	3.5 - 6.5	1.6 - 7.1	14,362	5.6%	Herndon	Fine, kaolinitic, thermic Typic Kanhapludults	Ultisols	
Goldston	channery silt loam	6 - 15	ridges/backslope	linear/convex	residuum from metavol/argillite	10-20	>80	3.5 - 5.5	0.5 - 7.0	783	0.3%	Goldston	Loamy-skeletal, siliceous, semiactive, thermic, shallow Typic Dystrudepts	Inceptisols	
Goldston	channery silt loam	15 - 45	ridges/backslope	linear/convex	residuum from metavol/argillite	10-20	>80	3.5 - 5.5	0.5 - 7.0	1,957	0.8%	Goldston	Loamy-skeletal, siliceous, semiactive, thermic, shallow Typic Dystrudepts	Inceptisols	
Appling - Urban	complex	2 - 10	ridges/backslope	linear/convex	saprolite granite/gneiss/schist	> 80	>80	4.5 - 5.5	1.6 - 6.5	927	0.4%	Appling - Urban	Fine, kaolinitic, thermic Typic Kanhapludults	Ultisols	
Appling	sandy loam	2 - 6	interfluves/summit	convex	saprolite granite/gneiss/schist	> 80	>80	4.5 - 6.5	1.6 - 6.5	14,198	5.5%	Appling	Fine, kaolinitic, thermic Typic Kanhapludults	Ultisols	
Appling	sandy loam	6 - 10	ridges/backslope	linear/convex	saprolite granite/gneiss/schist	> 80	>80	4.5 - 6.5	1.6 - 6.5	7,215	2.8%	Appling	Fine, kaolinitic, thermic Typic Kanhapludults	Ultisols	
Wateree (Louisburg)	sandy loam	6 - 15	ridges/backslope	linear/convex	saprolite granite/gneiss	20-40	>80	4.5 - 6.0	1.3 - 5.7	1,716	0.7%	Wateree (Louisburg)	Coarse-loamy, mixed, semiactive, thermic Typic Dystrudepts	Inceptisols	
Wateree (Louisburg)	sandy loam	15 - 45	ridges/backslope	linear/convex	saprolite granite/gneiss	20-40	>80	4.5 - 6.0	1.3 - 5.7	2,223	0.9%	Wateree (Louisburg)	Coarse-loamy, mixed, semiactive, thermic Typic Dystrudepts	Inceptisols	
Pits	quarry				granite/gneiss	-	-	-		128	0.0%	Pits			
Urban land					impervious layers	> 200	> 200	-		825	0.3%	Urban land			
Water						-	-	-		2,196	0.9%	Water			
	Totals									256,697	100.0%				

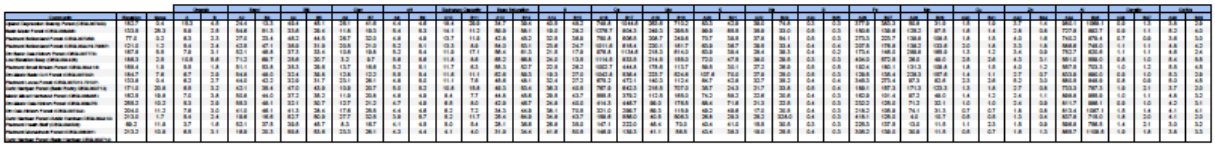
Sources:
Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed 8/31/2011

Data Source Information:
Soil Survey Area: Orange County, North Carolina
Survey Area Data: Version 11, Feb 19, 2010

Reports used:
Available Water Supply, 0 - 150 cm, 9/29/2011
Chemical Soil Properties, 9/29/2011
Map Unit Description, 9/6/2011, 1/17/2012
Parent Material Name, 9/6/2011
Soil Taxonomy Classification 8/31/2011

Source copies in binder.

Attachment 2
Carolina Vegetation Survey
Community Properties Table



Attachment 3
Orange County Major Rock Type by Natural Community

	Piedmont Upland Forests						Piedmont Open Upland		Piedmont Alluvial Wetland			Nonalluvial Wetland	
	Mesic			*Sub-xeric*			*Shrubby*	*Poorly-drained*	*Large river*		*Small stream*	*Depression*	*Seep*
Major Rock Type	Mesic Mixed HW	Basic Mesic	Dry-Mesic Oak-Hickory	Basic Oak-Hickory	Dry Oak-Hickory	Piedmont Monadnock	Piedmont Heath Bluff	Xeric Hardpan	Piedmont Bottomland	Piedmont Levee	Piedmont Alluvial	Upland Depr Swamp	Low Elevation Seep
Alluvium	x	x							x	x	x		
Triassic Sediments (braided stream deposits)			x	x	x								
Diabase (Jurassic)		x		x				x				x	
1 - Altered Tuffs (hydrothermal alteration; high sulfidation)	x		x		x	x	x						
2 - Epiclastic Rocks (sedimentary volcanic/plutonics)	x	x	x	x	x	x	x	x				x	
3 - Felsic Tuffs (volcanic ash)	x		x		x	x	x						
4 - Felsic Lavas & Tuffs - dacite domes (viscous)	x		x		x	x	x						
5 - Mafic Lavas & Tuffs - andesite to basalt (less viscous)		x		x				x				x	
6 - Felsic Plutonic Rocks	x		x		x	x	x						
7 - Intermediate Plutonic - diorite	x	x	x	x	x	x							
8 - Mafic Plutonic - gabbro w/minor ultramafic		x		x				x				x	

Soil series assumptions:

Alluvium - Altavista, Chewacla, Congaree

Triassic - Creedmoor, White Store

Diabase - Enon, Iredell, Lloyd, Wilkes (Lloyd very weathered; old terraces)

Altered Tuffs - Georgeville, Goldston, Herndon, Tarrus

Epiclastic Rocks - Excludes Alluvium, Triassic

Felsic Lavas and Tuffs - Georgeville, Goldston, Herndon,

Lignum, Tarrus

Mafic Lavas and Tuffs - ?

Felsic Plutonic - Appling, Cecil, Wateree, Wedowee

Intermediate Plutonic - Helena, Helena-Sedgefield,

Orange, Vance

Mafic Plutonic - Enon, Iredell, Lloyd, Wilkes (Lloyd very weathered; old terraces)

Sources:

Peet, R.K., T.R. Wentworth, M. P. Schafale & A.S. Weakley. 2004. Carolina Vegetation Survey database. Version 3.0. North Carolina Botanical Garden. Chapel Hill, NC 27599.

Schafale, M.P. and A.S. Weakley. 1990. Classification of the Natural Communities of North Carolina, 3rd Approximation. Raleigh, NC. Available at http://www.ncnhp.org/.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed 8/31/2011.

Attachment 4
Orange County Soil Series by Community

	Piedmont Mesic Forests			Piedmont Oak Forests					Pied. Barrens	Nonalluvial Wetlands		Piedmont Floodplains			
			Open canopy							*Depression*	*Seep*	*Small stream*	*Large river*		
Soil Series	Mesic Mixed HW	Basic Mesic	Piedmont Heath Bluff	Dry-Mesic Oak-Hickory	Dry-Mesic Basic Oak-Hickory	Dry Oak-Hickory	Dry Basic Oak-Hickory	Piedmont Monadnock	Xeric Hardpan	Upland Depr Swamp	Low Elevation Seep	Piedmont Alluvial	Piedmont Levee	Piedmont Bottomland	Total by Soil Series
Altavista	X											X		X	3
Appling				X		X									2
Cecil				X		X									2
Chewacla		X										X	X	X	4
Congaree	X											X	X	X	4
Creedmoor				X		X									2
Enon		X			X		X								3
Georgeville				X		X		X							3
Goldston			X			X		X							3
Helena	X	X													2
Helena-Sedgefield	X	X													2
Herndon				X		X		X							3
Iredell							X		X	X					3
Lignum						X									1
Lloyd (Tirzessee)	X			X											2
Orange						X	X								2
Tarrus (Tatum)	X		X	X		X		X							5
Vance				X	X										2
Wateree (Louisburg)	X			X		X									3
Wedowee	X		X	X		X		X							5
White Store					X		X								2
Wilkes		X			X		X								3
Total by Community	9	6	3	10	4	11	6	6	1	1	0	3	2	3	81

Color Key:

tan	S&W
blue	S&W, CVS
purple	CVS
green	Schafale/ Weakley email, 2011
orange	Judgment based on soil series characteristics

Sources: Classification of the Natural Communities of North Carolina, 3rd Approximation, Schafale and Weakley, 1990.
Guide to the Natural Communities of North Carolina, 4th Approximation, Michael P. Schafale, NC Natural Heritage Program, DENR, March 2012.
Peet, R.K., T.R. Wentworth, M. P. Schafale & A.S. Weakley. 2004. Carolina Vegetation Survey database. Version 3.0. North Carolina Botanical Garden. Chapel Hill, NC 27599. Accessed 2

Attachment 5a
Piedmont Mesic Forest Flora

Scientific Name	Common Name	Family	Mesic Mixed HW	Basic Mesic	Piedmont Heath Bluff
Dominant Trees:					
Acer floridanum	Southern Sugar Maple	Sapindaceae		X	
Acer rubrum	Red Maple	Sapindaceae	x		
Acer saccharum	Sugar Maple	Sapindaceae	x		
Celtis laevigata	Southern Hackberry	Cannabaceae		x	
Fagus grandifolia	American Beech	Fagaceae	X	X	x
Fraxinus americana	White Ash	Oleaceae		X	
Juglans nigra	Black Walnut	Juglandaceae		x	
Liriodendron tulipifera	Tulip-tree	Magnoliaceae	X	X	
Pinus taeda	Loblolly Pine	Pinaceae			x
Pinus virginiana	Virginia Pine	Pinaceae			x
Quercus alba	White Oak	Fagaceae			x
Quercus montana	Chestnut Oak	Fagaceae			x
Quercus nigra	Water Oak	Fagaceae	X		
Quercus rubra	Red Oak	Fagaceae	X	X	
Quercus shumardii	Shumard Oak	Fagaceae		x	
Understory Trees:					
Acer rubrum	Red Maple	Sapindaceae	x		x
Amelanchier arborea	Downy Serviceberry	Rosaceae			x
Asimina triloba	Pawpaw	Annonaceae		x	
Carpinus caroliniana	Ironwood, American Hornbeam	Betulaceae		x	
Cercis canadensis	Eastern Redbud	Fabaceae		x	
Cornus florida	Flowering Dogwood	Cornaceae	x	x	
Ilex opaca	American Holly	Aquifoliaceae	x		
Ostrya virginiana	American Hop-hornbeam	Betulaceae	x	x	
Oxydendrum arboreum	Sourwood	Ericaceae			x
Ulmus rubra	Slippery Elm	Ulmaceae		x	
Shrubs:					
Aesculus sylvatica	Painted Buckeye	Sapindaceae		x	
Calycanthus floridus	Sweet Shrub	Calycanthaceae		x	
Euonymus americanus	Strawberry-bush	Celastraceae	x		
Euonymus atropurpureus	American Wahoo	Celastraceae		x	
Hamamelis virginiana	Northern Witch-hazel	Hamamelidaceae			x
Hydrangea arborescens	Smooth Hydrangea	Hydrangeaceae		x	
Kalmia latifolia	Mountain Laurel	Ericaceae	x		X
Lindera benzoin	Spicebush	Lauraceae		x	
Rhododendron catawbiense	Catawba Rhododendron	Ericaceae			X
Rhododendron maximum	Great Laurel	Ericaceae			x
Staphylea trifolia	Bladdernut	Staphyleaceae		x	
Styrax grandifolius	Bigleaf Snowbell	Styracaceae		x	
Vaccinium pallidum	Hillside Blueberry	Ericaceae			x
Vaccinium stamineum	Deerberry	Ericaceae	x		x
Viburnum rafinesquianum	Downy Arrow-wood	Adoxaceae	x		
Viburnum spp.		Adoxaceae		x	
Herbs:					
Actaea pachypoda	Doll's-eyes	Ranunculaceae		x	
Actaea racemosa	Common Black Cohosh	Ranunculaceae		x	
Adiantum pedatum	Northern Maidenhair	Pteridaceae		x	
Anemone americana	Round-lobed Hepatica	Ranunculaceae	x	x	
Aquilegia canadensis				x	
Asarum canadense	Common Wild Ginger	Aristolochiaceae		x	
Botrypus virginianus	Rattlesnake Fern	Ophioglossaceae	x		
Cardamine angustata	Eastern Slender Toothwort	Brassicaceae	x		
Cardamine concatenata	Cutleaf Toothwort	Brassicaceae		x	
Chamaelirium luteum	Devil's Bit	Heloniadaceae	x		
Chimaphila maculata	Pipsissewa	Ericaceae			x
Corydalis flavula	Short-spurred Corydalis	Fumariaceae		x	
Cypripedium parviflorum var.	Large Yellow Lady's Slipper	Orchidaceae		x	
Delphinium tricorne	Dwarf Larkspur	Ranunculaceae		x	
Dicentra cucullaria	Dutchman's Britches	Fumariaceae		x	
Enemion biternatum	False Rue-anemone	Ranunculaceae		x	
Epifagus virginiana	Beechdrops	Orobanchaceae	x		
Epigaea repens	Trailing Arbutus	Ericaceae			x
Erythronium umbilicatum spp.	Dimpled Trout Lily	Liliaceae	x		
Galax urceolata	Galax	Diapensiaceae			x
Gallium circaezans	Southern Forest Bedstraw	Rubiaceae	x		
Gaultheria procumbens	Wintergreen	Ericaceae			x
Geranium maculatum	Wild Geranium	Geraniaceae	x		
Heuchera americana	American Alumroot	Saxifragaceae	x		
Hexastylis arifolia	Little Brown Jug	Aristolochiaceae	x		
Hexastylis minor	Little Heartleaf	Aristolochiaceae	x		x
Hexastylis virginica	Virginia Heartleaf	Aristolochiaceae	x		
Hybanthus concolor	Green-violet	Violaceae		x	
Hylodesmum nudiflorum	Naked Tick-trefoil	Fabaceae	x		
Lathyrus venosus	Forest Pea	Fabaceae		x	
Menispermum canadense	Moonseed	Menispermaceae		x	
Mitchella repens	Partridge-berry	Rubiaceae			x
Panax quinquefolius	American Ginseng	Araliaceae		x	
Panicum spp.			x		
Podophyllum peltatum	May-apple	Berberidaceae	x	x	
Polystichum acrostichoides	Christmas Fern	Dryopteridaceae	x	x	
Prenanthes serpentaria	Lion's Foot	Asteraceae	x		
Sanguinaria canadensis	Bloodroot	Papaveraceae		x	
Stellaria pubera	Star Chickweed	Caryophyllaceae	x		
Tiarella cordifolia	Foamflower	Saxifragaceae	x	x	
Trillium cuneatum	Sweet Betsy	Trilliaceae		x	
Viola spp.	Violet	Violaceae	x	x	

Color Key:

tan	3rd Approximation
blue	3rd and 4th Approximations
purple	4th Approximation
orange font	Orange font represents the intermediate variant containing the more widespread and broadly tolerant plant species.
red font	Red font represents the basic variant including the more narrowly tolerant base-loving plant species.
bold font	Bold font represents a dominant community plant species.

Sources:

Classification of the Natural Communities of North Carolina, 3rd Approximation, Schafale and Weakley, NC Natural Heritage Program, Division of Parks and Recreation, DENR, 1990.
Flora of the Southern and Mid-Atlantic States, Alan S. Weakley, UNC Herbarium, NCBG, UNC Chapel Hill, May 2011.
Guide to the Natural Communities of North Carolina, 4th Approximation, Michael P. Schafale, NC Natural Heritage Program, DENR, March 2012.

Attachment 5b
Piedmont Oak Forest Flora

Scientific Name	Common Name	Family	Dry-Mesic Oak-Hickory	Basic Dry-Mesic Oak-Hickory	Dry Oak-Hickory	Basic Dry Oak-Hickory	Piedmont Monadnock
Dominant Trees:							
Acer floridanum	Southern Sugar Maple	Sapindaceae		x			
Carya carolinae-septentionalis	Carolina Sheabark Hickory	Juglandaceae		x		x	
Carya glabra	Pignut Hickory	Juglandaceae	x	x	x	x	x
Carya ovalis	Red Hickory	Juglandaceae	x	x	x	x	
Carya ovata	Common Shagbark Hickory	Juglandaceae		x			
Carya tomentosa	Mockernut Hickory	Juglandaceae	x	x	x	x	x
Celtis laevigata	Southern Hackberry	Cannabaceae		x			
Fraxinus americana	White Ash	Oleaceae		x		x	
Juglans nigra	Black Walnut	Juglandaceae		x		x	
Liquidambar styraciflua	Sweet Gum	Altingiaceae	x				
Liriodendron tulipifera	Tulip-tree	Magnoliaceae	x	x		x	
Pinus echinata	Shortleaf Pine	Pinaceae			x		x
Pinus spp.	Pine	Pinaceae	x	x	x	x	
Pinus virginiana	Virginia Pine	Pinaceae			x		x
Quercus alba	White Oak	Fagaceae	X	X	X	x	x
Quercus coccinea	Scarlet Oak	Fagaceae			x		x
Quercus falcata	Southern Red Oak	Fagaceae			X	x	x
Quercus marilandica	Blackjack Oak	Fagaceae			x		x
Quercus montana	Chestnut Oak	Fagaceae			x		X
Quercus muehlenbergii	Yellow Oak	Fagaceae		x		x	
Quercus rubra	Red Oak	Fagaceae	x	x			
Quercus stellata	Post Oak	Fagaceae		x	X	x	x
Quercus velutina	Black Oak	Fagaceae	x	x	x	x	
Understory Trees:							
Acer leucoderme	Chalk Maple	Sapindaceae		x		x	
Acer rubrum	Red Maple	Sapindaceae	x		x		X
Cercis canadensis	Eastern Redbud	Fabaceae		x		x	
Chionanthus virginicus	Fringe-tree	Oleaceae		x		x	
Cornus florida	Flowering Dogwood	Cornaceae	x	x	x	x	x
Ilex opaca	American Holly	Aquifoliaceae	x				
Juniperus virginiana	Eastern Red Cedar	Cupressaceae				x	
Nyssa sylvatica	Black Gum	Nyssaceae	x		x		x
Ostrya virginiana	American Hop-hornbeam	Betulaceae		x		x	
Oxydendrum arboreum	Sourwood	Ericaceae	x		x		X
Ulmus alata	Winged Elm	Ulmaceae					
Vaccinium arboreum	Farkleberry	Ericaceae			x		
Shrubs:							
Aesculus sylvatica	Painted Buckeye	Sapindaceae		x		x	
Calycanthus floridus	Sweet-shrub	Calycanthaceae		x		x	
Euonymus americanus	Strawberry-bush	Celastraceae	x				
Frangula caroliniana	Carolina Buckthorn	Rhamnaceae		x		x	
Gaylussacia baccata	Black Huckleberry	Ericaceae					x
Kalmia latifolia	Mountain Laurel	Ericaceae					x
Rhus aromatica	Fragrant Sumac	Anacardiaceae		x		x	
Symphoricarpos orbiculatus	Coralberry	Caprifoliaceae		x		x	
Symplocos tinctoria	Sweetleaf	Symplocaceae					
Vaccinium pallidum	Hillside Blueberry	Ericaceae	x		x		x
Vaccinium stamineum	Deerberry	Ericaceae	x		x		x
Vaccinium tenellum	Southern Blueberry	Ericaceae	x		x		
Viburnum acerifolium	Mapleleaf Viburnum	Adoxaceae		x		x	
Viburnum prunifolium	Black Haw	Adoxaceae		x		x	
Viburnum rafinesquianum	Downy Arrow-wood	Adoxaceae	x	x		x	
Vines:							
Toxicodendron radicans	Poison Ivy	Anacardiaceae	x		x		x
Vitis rotundifolia	Muscadine	Vitaceae	x		x		x
Herbs:			fairly sparse	moderately diverse*	generally sparse	moderately diverse	sparse
Brachyelytrum erectum	Common Shorthusk	Poaceae		x			
Carex artitecta	NOT IN FLORA	Cyperaceae		x		x	
Carex nigromarginata	Blackedge Sedge	Cyperaceae		x		x	
Chimaphila maculata	Pipsissewa	Ericaceae	x		x		x
Coreopsis major	Woodland Coreopsis	Asteraceae			x		
Coreopsis verticillata	Threadleaf Coreopsis	Asteraceae					x
Danthonia spicata	Poverty Oat-grass	Poaceae			x		x
Dichanthelium boscii	Bosc's Witch Grass	Poaceae		x			
Elymus hystrix	Common Bottlebrush Grass	Poaceae		x			
Elymus virginicus	Common Eastern Wild-rye	Poaceae		x			
Endodeca serpentaria	Turpentine-root	Aristolochiaceae		x		x	
Euphorbia corollata	Eastern Flowering Spurge	Euphorbiaceae		x		x	
Galium circaezans	Southern Forest Bedstraw	Rubiaceae		x		x	
Goodyera pubescens	Downy Rattlesnake-orchid	Orchidaceae	x				
Hexastylis arifolia	Little Brown Jug	Aristolochiaceae	x		x		
Hieracium venosum	Veiny Hawkweed	Asteraceae	x		x		x
Hylodesmum nudiflorum	Naked Tick-trefoil	Fabaceae	x				x
Phegopteris hexagonoptera	Broad Beech Fern	Thelypteridaceae		x			
Physocarpus leptobachya	American Ninebark	Rosaceae		x			
Piptochaetium avenaceum	Eastern Needlegrass	Poaceae			x		
Polygonatum biflorum	Small Solomon's-seal	Ruscaceae		x		x	
Pteridium aquilinum	Bracken Fern	Dennstaedtiaceae					x
Schizachyrium scoparium	Common Little Bluestem	Poaceae					x
Scleria oligantha	Few-flowered Nutrush	Cyperaceae		x		x	
Tephrosia virginiana	Virginia Goat's-rue	Fabaceae			x		x
Uvularia perfoliata	Perfoliate Bellwort	Colchicaceae		x		x	

Color Key:

tan	3rd Approximation
blue	3rd and 4th Approximations
purple	4th Approximation
orange font	Orange font represents herbs of more mesic or floodplain communities.
bold font	Bold font represents a dominant community plant species.

Sources:

Classification of the Natural Communities of North Carolina, 3rd Approximation, Schafale and Weakley, NC Natural Heritage Program, Division of Parks and Recreation, DENR, 1990.
Flora of the Southern and Mid-Atlantic States, Alan S. Weakley, UNC Herbarium, NCSC, UNC Chapel Hill, May 2011.
Guide to the Natural Communities of North Carolina, 4th Approximation, Michael P. Schafale, NC Natural Heritage Program, DENR, March 2012.

Attachment 5c
Other Upland Flora

Scientific Name	Common Name	Family	Xeric Hardpan	Upland Depression Swamp	Low Elevation Seep
Dominant Trees:					
Carya carolinae-septentrionalis	Carolina Shagbark Hickory	Juglandaceae	x	x	
Carya glabra	Pignut Hickory	Juglandaceae	x		
Carya ovata	Common Shagbark Hickory	Juglandaceae		x	
Fraxinus americana	White Ash	Oleaceae	x		
Liquidambar styraciflua	Sweet Gum	Altingiaceae	x	x	
Liriodendron tulipifera	Tulip-tree	Magnoliaceae		x	
Pinus echinata	Shortleaf Pine	Pinaceae	x		
Pinus virginiana	Virginia Pine	Pinaceae	x		
Quercus alba	White Oak	Fagaceae	x		
Quercus bicolor	Swamp White Oak	Fagaceae		x	
Quercus lyrata	Overcup Oak	Fagaceae		x	
Quercus marilandica	Blackjack Oak	Fagaceae	x		
Quercus michauxii	Basket Oak	Fagaceae		x	
Quercus phellos	Water Oak	Fagaceae	x	X	x
Quercus rubra	Red Oak	Fagaceae			
Quercus stellata	Post Oak	Fagaceae	X	x	
Understory Trees:					
Acer leucoderme	Chalk Maple	Sapindaceae	x		
Acer rubrum	Red Maple	Sapindaceae		x	x
Cercis canadensis	Eastern Redbud	Fabaceae	x		
Chionanthus virginicus	Fringe-tree	Oleaceae	x		
Diospyros virginiana	American Persimmon	Ebenaceae	x		
Juniperus virginiana	Eastern Red Cedar	Cupressaceae	x		
Lindera benzoin					x
Nyssa biflora	Swamp Tupelo	Nyssaceae		x	
Ulmus alata	Winged Elm	Ulmaceae	x		
Vaccinium arboreum	Farkleberry	Ericaceae	x		
Shrubs:					
Cephalanthus occidentalis	Buttonbush	Rubiaceae		x	
Ilex decidua	Possum-haw	Aquifoliaceae		x	
Rhus aromatica	Fragrant Sumac	Anacardiaceae	x		
Symphoricarpos orbiculatus	Coralberry	Caprifoliaceae	x		
Vaccinium corymbosum	Smooth Highbush Blueberry	Ericaceae		x	
Vaccinium fuscatum	Hairy Highbush Blueberry	Ericaceae		x	
Vaccinium pallidum	Hillside Blueberry	Ericaceae	x		
Vaccinium stamineum	Deerberry	Ericaceae	x		
Viburnum cassinoides		Adoxaceae			x
Viburnum dentatum	Arrow-wood	Adoxaceae		x	
Viburnum nudum		Adoxaceae			x
Viburnum prunifolium	Black Haw	Adoxaceae	x		
Viburnum rafinesquianum	Downy Arrow-wood	Adoxaceae	x		
Vines:					
Campsis radicans	Trumpet-creeper	Bignoniaceae		x	
Parthenocissus quinquefolia	Virginia-creeper	Vitaceae	x		
Toxicodendron radicans	Poison Ivy	Anacardiaceae		x	
Vitis rotundifolia	Muscadine	Vitaceae	x	x	
Herbs:					
Boehmeria cylindrica	False-nettle	Urticaceae			x
Carex spp.		Cyperaceae		x	x
Chelone glabra	White Turtlehead	Plantaginaceae			x
Claytonia virginica	Spring-beauty	Montiaceae		x	
Clematis ochroleuca	Curlyheads	Ranunculaceae	x		
Climacium americanum	Moss			x	
Danthonia spicata	Poverty Oat-grass	Poaceae	x		
Eleocharis tenuis	Spikerush	Cyperaceae		x	
Glyceria septentrionalis	Floating Mannagrass	Poaceae		x	
Hieracium gronovii	Beaked Hawkweed	Asteraceae	x		
Hieracium venosum	Veiny Hawkweed	Asteraceae	x		
Hypericum hypericoides	St. Andrew's Cross	Hypericaceae	x		
Impatiens capensis	Orange Jewelweed	Hydrangeaceae			x
Juncus effusus	Common Rush	Juncaceae		x	x
Lespedeza spp.	Lespedeza	Fabaceae	x		
Liatris pilosa	Wildenow	Asteraceae	x		
Lycopus virginicus	Virginia Bugleweed	Lamiaceae			x
Micranthes micranthidifolia	Branch-lettuce	Saxifragaceae			x
Oenothera fruticosa	Southern Sundrops	Onagraceae	x		
Osmundastrum cinnamomeum	Cinnamon Fern	Osmundaceae			x
Osmunda regalis	Royal Fern	Osmundaceae			x
Piptochaetium avenaceum	Eastern Needlegrass	Poaceae	x		
Ranunculus recurvatus	Hooked Buttercup	Ranunculaceae			x
Rudbeckia laciniata	Common Cutleaf Coneflower	Asteraceae			x
Saururus cernuus	Lizard's Tail	Saururaceae			x
Schizachyrium scoparium	Common Little Bluestem	Poaceae	x		
Selaginella apoda	Meadow spikemoss	Selaginellaceae		x	
Sericocarpus linifolius	Narrow-leaf White-topped Aster	Asteraceae	x		
Solidago spp.	Goldenrod	Asteraceae	x		
Sphagnum lescurii	Moss			x	
Spiranthes cernua	Nodding Ladies'-tresses	Orchidaceae		x	
Symphyotrichum dumosum	Long-stalked Aster	Asteraceae	x		
Woodwardia areolata	Netted Chain Fern	Blechnaceae			x

Color Key:

tan	3rd Approximation
blue	3rd and 4th Approximations
purple	4th Approximation
bold font	Bold font represents a dominant community plant species.

Sources:

Classification of the Natural Communities of North Carolina, 3rd Approximation, Schafale and Weakley, NC Natural Heritage Program, Division of Parks and Recreation, DENR, 1990.

Flora of the Southern and Mid-Atlantic States. Alan S. Weakley. UNC Herbarium, NCSG, UNC Chapel Hill. May 2011.

Guide to the Natural Communities of North Carolina, 4th Approximation, Michael P. Schafale, NC Natural Heritage Program, DENR, March 2012.

Attachment 5d
Piedmont Floodplain Flora

Scientific Name	Common Name	Family	Piedmont Alluvial	Piedmont Levee	Piedmont Bottomland
Dominant Trees:					
Acer negundo	Box Elder	Sapindaceae		X	x
Acer rubrum	Red Maple	Sapindaceae	x	x	
Betula nigra	River Birch	Betulaceae	x	X	
Carya cordiformis	Bitternut Hickory	Juglandaceae	x	x	x
Carya ovata	Shagbark Hickory	Juglandaceae	x	x	x
Celtis laevigata	Southern Hackberry	Cannabaceae	x	X	x
Fagus grandifolia	American Beech	Fagaceae			x
Fraxinus pennsylvanica	Green Ash	Oleaceae	x	x	x
Juglans nigra	Black Walnut	Juglandaceae	x	x	
Liquidambar styraciflua	Sweet Gum	Altingiaceae	x	x	x
Liriodendron tulipifera	Tulip-tree	Magnoliaceae	x	x	x
Pinus taeda	Loblolly Pine	Pinaceae			x
Platanus occidentalis	Sycamore	Platanaceae	x	X	
Quercus alba	White Oak	Fagaceae			x
Quercus imbricaria	Shingle Oak	Fagaceae	x		
Quercus lyrata	Swamp White Oak	Fagaceae			x
Quercus michauxii	Basket Oak	Fagaceae		x	x
Quercus nigra	Water Oak	Fagaceae			x
Quercus pagoda	Cherrybark Oak	Fagaceae		x	x
Quercus phellos	Water Oak	Fagaceae			x
Ulmus americana	American Elm	Ulmaceae	x	x	x
Understory Trees:					
Acer floridanum	Southern Sugar Maple	Sapindaceae	x		x
Acer negundo	Box Elder	Sapindaceae	x	x	
Acer rubrum	Red Maple	Sapindaceae	x		x
Asimina triloba	Pawpaw	Annonaceae	x	x	x
Carpinus caroliniana	Ironwood, American Hornbeam	Betulaceae	x	x	x
Cornus florida	Flowering Dogwood	Cornaceae			x
Ilex decidua	Possum-haw	Aquifoliaceae			x
Ilex opaca	American Holly	Aquifoliaceae	x	x	x
Shrubs:					
Aesculus sylvatica	Painted Buckeye	Sapindaceae	x	x	x
Arundinaria gigantea	Giant Cane	Poaceae		x	x
Cornus amomum	Silky Dogwood	Cornaceae	x		
Corylus cornuta	Beaked Hazelnut	Betulaceae	x		
Eubotrys recurva	Mountain Fetterbush	Ericaceae	x		
Euonymus americanus	Strawberry-bush	Celastraceae	x		x
Lindera benzoin	Spicebush	Lauraceae	x	x	
Xanthorhiza simplicissima	Yellowroot	Ranunculaceae	x	x	
Vines:					
Bignonia capreolata	Crossvine	Bignoniaceae	x	x	x
Campsis radicans	Trumpet-creeper	Bignoniaceae		x	
Menispermum canadense	Moonseed	Menispermaceae	x		x
Parthenocissus quinquefolia	Virginia-creeper	Vitaceae	x	x	x
Smilax spp.	Greenbrier	Smilacaceae	x	x	x
Toxicodendron radicans	Poison Ivy	Anacardiaceae	x	x	x
Vitis spp.	Wild Grape	Vitaceae	x	x	x
Herbs:					
Amphicarpaea bracteata	Hog-peanut	Fabaceae	x		x
Arisaema triphyllum	Small Jack-in-the-Pulpit	Araceae	x		x
Asarum canadense	Common Wild Ginger	Aristolochiaceae			x
Boehmeria cylindrica	False Nettle	Urticaceae	x	x	x

Botrypus virginianus	Rattlesnake Fern	Ophioglossaceae	x	x	x
Carex laxiflora	Sedge	Cyperaceae	x		
Carex lupulina	Hop Sedge	Cyperaceae			x
Carex spp.	Sedge	Cyperaceae			x
Carex tribuloides	Sedge	Cyperaceae			x
Chasmanthium latifolium	River Oats	Poaceae		x	x
Chasmanthium laxum	Slender Spikegrass	Poaceae	x	x	x
Claytonia virginica	Southern Spring-beauty	Montiaceae	x	x	
Clematis virginiana	Virgin's Bower	Ranunculaceae		x	
Corydalis flavula	Short-spurred Corydalis	Fumariaceae	x	x	
Cryptotaenia canadensis	Honewort	Apiaceae	x		x
Dichanthelium boscii	Bosc's Witch Grass	Poaceae			x
Dichanthelium caerulescens	Blue Witch Grass	Poaceae	x		
Dichanthelium laxiflorum	Open-flower Witch Grass	Poaceae			x
Elymus hystrix	Common Bottlebrush Grass	Poaceae	x	x	
Elymus virginicus	Common Eastern Wild-rye	Poaceae	x	x	x
Erythronium umbilicatum spp	Dimpled Trout Lily	Liliaceae	x		
Eurybia divaricata	Common White Heart-leaved Aste	Asteraceae	x	x	x
Geum canadense	Strawberry?	Rosaceae	x		
Glyceria striata	Fowl Mannagrass	Poaceae			x
Hexastylis arifolia	Little Brown Jug	Aristolochiaceae			x
Hypericum hypericoides	St. Andrew's Cross	Hypericaceae			x
Impatiens capensis	Orange Jewelweed	Hydrangeaceae	x		
Juncus effusus	Common Rush	Juncaceae			x
Micranthes virginiensis	Early Saxifrage	Saxifragaceae		x	
Mitchella repens	Partridge-berry	Rubiaceae			x
Osmorhiza longistylis	Anise-Root	Apiaceae		x	
Packera aurea	Golden Ragwort	Asteraceae	x		x
Persicaria virginiana	Jumpseed	Polygonaceae	x		x
Polygonatum biflorum	Small Solomon's-seal	Ruscaceae			x
Polystichum acrostichoides	Christmas Fern	Dryopteridaceae	x		x
Rudbeckia laciniata	Common Cutleaf Coneflower	Asteraceae		x	
Saururus cernuus	Lizard's Tail	Saururaceae			x
Sedum ternatum	Mountain Stonecrop	Crassulaceae	x	x	
Solidago caesia	Axillary Goldenrod	Asteraceae	x	x	x
Stellaria pubera	Star Chickweed	Caryophyllaceae	x	x	
Uvularia sessilifolia	Straw-lily	Colchicaceae	x		
Verbesina alternifolia	Common Wingstem	Asteraceae	x	x	
Viola spp.	Violet	Violaceae	x	x	x
Invasion by:					
Ligustrum sinense	Chinese Privet	Oleaceae		x	
Lonicera japonica	Japanese Honeysuckle	Caprifoliaceae	x	x	x
Microstegium vimineum	Japanese Stilt-grass	Poaceae	x	x	x

Color Key:

tan	3rd Approximation
blue	3rd and 4th Approximations
purple	4th Approximation
orange font	Orange font represents the bottomland low subtype.
red font	Red font represents the bottomland high subtype.
bold font	Bold font represents a dominant community plant species.

Sources:

Classification of the Natural Communities of North Carolina, 3rd Approximation. Schafale and Weakley. NC Natural Heritage Program. Division of Parks and Recreation. DENR. 19
Flora of the Southern and Mid-Atlantic States. Alan S. Weakley. UNC Herbarium, NCDG, UNC Chapel Hill, May 2011.
Guide to the Natural Communities of North Carolina, 4th Approximation, Michael P. Schafale, NC Natural Heritage Program, DENR, March 2012.

Piedmont Flora by Natural Community
MESIC MIXED FOREST - CEGL008465

Scientific Name	Common Name	CVS Constancy	Abundance
Dominant Trees:			
Fagus grandifolia	American Beech	100%	Abundant
Quercus rubra	Red Oak	100%	
Liriodendron tulipifera	Tulip-tree	89%	
Acer rubrum	Eastern Red Maple	100%	Moderately Abundant
Carya glabra	Pignut Hickory	100%	
Quercus alba	White Oak	78%	
Fraxinus americana	White Ash	89%	Occasional to Locally Abundant
Liquidambar styraciflua	Sweet Gum	89%	
Quercus velutina	Black Oak	67%	
Carya tomentosa	Mockernut Hickory	56%	
Carya cordiformis	Bitternut Hickory	44%	
Understory Trees:			
Acer rubrum	Eastern Red Maple	100%	Abundant
Oxydendrum arboreum	Sourwood	100%	
Cornus florida	Flowering Dogwood	89%	
Ilex opaca	American Holly	89%	
Nyssa sylvatica	Black Gum	89%	
Morus rubra	Red Mulberry	67%	Moderately Abundant
Prunus serotina	Black Cherry	67%	
Carpinus caroliniana	American Hornbeam	67%	Occasional to Locally Abundant
Amelanchier arborea	Downy Serviceberry	44%	
Cercis canadensis	Eastern Redbud	44%	
Chionanthus virginicus	Fringe-tree	44%	
Shrubs:			
Euonymus americanus	Strawberry-bush	100%	Abundant
Vaccinium pallidum	Hillside Blueberry	56%	Occasional to Locally Abundant
Viburnum acerifolium	Mapleleaf Viburnum	44%	
Rhododendron periclymenoides	Wild Azalea	33%	
Viburnum prunifolium	Black Haw	33%	
Calycanthus floridus	Sweet-shrub	22%	
Viburnum rufidulum	Southern Black Haw	22%	
Hamamelis virginiana	Northern Witch-hazel	11%	
Kalmia latifolia	Mountain Laurel	11%	
Vaccinium stamineum	Common Deerberry	11%	
Viburnum rafinesqueanum	Downy Arrow-wood	11%	
Vines:			
Muscadinia rotundifolia	Muscadine	100%	Abundant
Smilax spp.	Greenbrier	100%	
Parthenocissus quinquefolia	Virginia-creeper	89%	
Toxicodendron radicans	Eastern Poison Ivy	67%	Moderately Abundant
Bignonia capreolata	Cross-vine	56%	Occasional to Locally Abundant
Lonicera sempervirens	Coral honeysuckle	56%	
Herbs:			
Chimaphila maculata	Pipsissewa	89%	Abundant
Maianthemum racemosum	Eastern Solomon's-plume	89%	
Polystichum acrostichoides	Christmas Fern	89%	
Tiarella cordifolia	Heartleaf Foamflower	56%	(used Spiral's abundance class)
Hexastylis arifolia	Little Brown Jug	22%	(used Spiral's abundance class)
Podophyllum peltatum	May-apple	11%	(used Spiral's abundance class)
Erythronium umbilicatum	Dimpled Trout Lily	0%	(used Spiral's abundance class)
Galium circaezans	Southern Forest Bedstraw	78%	Moderately Abundant
Hylodesmum nudiflorum	Naked Tick-trefoil	78%	
Polygonatum biflorum	Small Solomon's-seal	67%	
Epifagus virginiana	Beechdrops	56%	Occasional to Locally Abundant
Mitchella repens	Partridge-berry	56%	
Uvularia perfoliata	Perfoliate Bellwort	56%	
Arisaema triphyllum	Common Jack-in-the-Pulpit	44%	
Botrypus virginianus	Rattlesnake Fern	44%	
Endodeca serpentaria	Turpentine-root	44%	
Goodyera pubescens	Downy Rattlesnake-orchid	44%	
Passiflora lutea	Eastern Yellow Passionflower	44%	
Sanguinaria canadensis	Bloodroot	44%	
Viola spp.	Violet	44%	
Anemone americana	Round-lobed Hepatica	33%	
Athyrium asplenioides	Southern Lady Fern	33%	
Chamaelirium luteum	Devil's Bit	33%	
Geranium maculatum	Wild Geranium	33%	
Solidago caesia	Axillary Goldenrod	33%	
Stellaria pubera	Star Chickweed	22%	
Thalictrum thalictroides	Rue-anemone	22%	
Tipularia discolor	Cranefly Orchid	22%	
Trillium catesbaei	Catesby's Trillium	22%	
Eutrochium purpureum	Purple-node Joe-pye-weed.	11%	
Hexastylis minor	Little Heartleaf	11%	
Iris cristata	Dwarf Crested Iris	11%	
Melica mutica	Two-flower Melic	11%	
Nabalus serpentarius	Lion's-foot	11%	
Cardamine angustata	Eastern Slender Toothwort	0%	
Chrysogonum virginianum	Green-and-gold	0%	
Heuchera americana	American Alumroot	0%	
Hexastylis virginica	Virginia Heartleaf	0%	

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Attachment 6b

Piedmont Flora by Natural Community
PIEDMONT HEATH BLUFF - CEGL004539

Scientific Name	Common Name	CVS Constancy	Abundance
Dominant Trees:			
Quercus alba	White Oak	75%	Occasional to Locally Abundant
Fagus grandifolia	American Beech	50%	
Quercus montana	Rock Chestnut Oak	50%	
Pinus virginiana	Virginia Pine	0%	
Understory Trees:			
Acer rubrum	Eastern Red Maple	100%	Occasional to Locally Abundant
Oxydendrum arboreum	Sourwood	75%	
Amelanchier arborea	Downy Serviceberry	50%	
Shrubs:			
Kalmia latifolia	Mountain Laurel	100%	Abundant
Rhododendron catawbiense	Catawba Rhododendron	0%	
Vaccinium pallidum	Hillside Blueberry	50%	Occasional to Locally Abundant
Hamamelis virginiana	Northern Witch-hazel	25%	
Vaccinium stamineum	Common Deerberry	25%	
Herbs:			
Mitchella repens	Partridge-berry	75%	Occasional to Locally Abundant
Galax urceolata	Galax	25%	
Hexastylis minor	Little Heartleaf	25%	
Chimaphila maculata	Pipsissewa	0%	
Epigaea repens	Trailing Arbutus	0%	
Gaultheria procumbens	Wintergreen	0%	

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Piedmont Flora by Natural Community
DRY-MESIC OAK-HICKORY FOREST - CEGL008475

Scientific Name	Common Name	CVS Constancy	Abundance
Dominant Trees:			
Quercus alba	**White Oak**	**93%**	Abundant
Quercus rubra	**Red Oak**	**87%**	
Quercus velutina	**Black Oak**	**87%**	
Carya glabra	**Pignut Hickory**	**80%**	
Carya tomentosa	**Mockernut Hickory**	**80%**	
Liriodendron tulipifera	Tulip-tree	60%	Moderately Abundant
Fagus grandifolia	American Beech	67%	Occasional to Locally Abundant
Fraxinus americana	White Ash	67%	
Liquidambar styraciflua	Sweet Gum	47%	
Pinus echinata	Shortleaf Pine	47%	
Quercus coccinea	Scarlet Oak	47%	
Quercus falcata	Southern Red Oak	33%	
Quercus phellos	Willow Oak	27%	
Quercus stellata	Post Oak	27%	
Quercus montana	Rock Chestnut Oak	27%	
Pinus virginiana	Virginia Pine	20%	
Understory Trees:			
Acer rubrum	Eastern Red Maple	93%	Abundant
Cornus florida	Flowering Dogwood	93%	
Nyssa sylvatica	Black Gum	87%	
Oxydendrum arboreum	Sourwood	87%	
Prunus serotina	Black Cherry	80%	
Sassafras albidum	Sassafras	80%	
Cercis canadensis	Eastern Redbud	53%	Occasional to Locally Abundant
Diospyros virginiana	American Persimmon	53%	
Juniperus virginiana	Eastern Red Cedar	47%	
Ilex opaca	American Holly	40%	
Chionanthus virginicus	Fringe-tree	27%	
Amelanchier arborea	Downy Serviceberry	20%	
Shrubs:			
Vaccinium pallidum	Hillside Blueberry	67%	Moderately Abundant
Euonymus americanus	Strawberry-bush	53%	Occasional to Locally Abundant
Vaccinium stamineum	Common Deerberry	47%	
Viburnum prunifolium	Black Haw	33%	
Viburnum rufidulum	Southern Black Haw	33%	
Rhododendron periclymenoides	Wild Azalea	27%	
Viburnum acerifolium	Mapleleaf Viburnum	27%	
Viburnum rafinesqueanum	Downy Arrow-wood	0%	
Vines:			
Muscadinia rotundifolia	Muscadine	93%	Abundant
Smilax spp.	Greenbrier	87%	
Parthenocissus quinquefolia	Virginia-creeper	80%	
Toxicodendron radicans	Eastern Poison Ivy	67%	Moderately Abundant
Lonicera sempervirens	Coral honeysuckle	33%	Occasional to Locally Abundant
Herbs:			
Chimaphila maculata	Pipsissewa	87%	Abundant
Polygonatum biflorum	Small Solomon's-seal	59%	Occasional to Locally Abundant
Galium circaezans	Southern Forest Bedstraw	53%	
Hylodesmum nudiflorum	Naked Tick-trefoil	53%	
Maianthemum racemosum	Eastern Solomon's-plume	53%	
Polystichum acrostichoides	Christmas Fern	47%	
Endodeca serpentaria	Turpentine-root	40%	
Uvularia perfoliata	Perfoliate Bellwort	33%	
Tipularia discolor	Cranefly Orchid	27%	
Asclepias variegata	White Milkweed	20%	
Trillium catesbaei	Catesby's Trillium	13%	
Carex pensylvanica	Sedge	13%	
Epigaea repens	Trailing Arbutus	7%	
Eutrochium purpureum	Purple-node Joe-pye-weed.	7%	
Goodyera pubescens	Downy Rattlesnake-orchid	7%	
Hexastylis arifolia	Little Brown Jug	7%	
Hexastylis minor	Little Heartleaf	7%	
Hieracium venosum	Veiny Hawkweed	7%	
Scutellaria incana	Skullcap	7%	
Zizia aurea	Common Golden-Alexanders	7%	
Hexastylis virginica	Virginia Heartleaf	0%	

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Piedmont Flora by Natural Community
DRY OAK-HICKORY FOREST - CEGL007244

Scientific Name	Common Name	CVS Constancy	Abundance
Dominant Trees:			
Quercus alba	**White Oak**	**100%**	Abundant
Quercus stellata	**Post Oak**	**50%**	
Quercus falcata	**Southern Red Oak**	**43%**	
Carya tomentosa	Mockernut Hickory	71%	Moderately Abundant
Quercus velutina	Black Oak	64%	
Quercus montana	Rock Chestnut Oak	57%	Occasional to Locally Abundant
Carya glabra	Pignut Hickory	50%	
Liquidambar styraciflua	Sweet Gum	50%	
Liriodendron tulipifera	Tulip-tree	50%	
Quercus rubra	Red Oak	50%	
Pinus virginiana	Virginia Pine	36%	
Quercus coccinea	Scarlet Oak	36%	
Quercus phellos	Willow Oak	36%	
Pinus echinata	Shortleaf Pine	29%	
Quercus marilandica	Blackjack Oak	14%	
Understory Trees:			
Acer rubrum	Eastern Red Maple	100%	Abundant
Nyssa sylvatica	Black Gum	100%	
Oxydendrum arboreum	Sourwood	93%	
Cornus florida	Flowering Dogwood	86%	
Ilex opaca	American Holly	86%	
Diospyros virginiana	American Persimmon	71%	Moderately Abundant
Prunus serotina	Black Cherry	71%	
Juniperus virginiana	Eastern Red Cedar	57%	Occasional to Locally Abundant
Sassafras albidum	Sassafras	57%	
Vaccinium arboreum	Farkleberry	43%	
Shrubs:			
Vaccinium pallidum	Hillside Blueberry	57%	Occasional to Locally Abundant
Vaccinium stamineum	Common Deerberry	50%	
Vaccinium tenellum	Small Cluster Blueberry	36%	
Gaylussacia baccata	Black Huckleberry	14%	
Ceanothus americanus	Common New Jersey Tea	7%	
Rhus copallinum	Winged Sumac	7%	
Vines:			
Smilax spp.	Greenbrier	93%	Abundant
Muscadinia rotundifolia	Muscadine	86%	
Parthenocissus quinquefolia	Virginia-creeper	71%	Moderately Abundant
Toxicodendron radicans	Eastern Poison Ivy	21%	Occasional to Locally Abundant
Herbs:			
Chimaphila maculata	Pipsissewa	79%	Moderately Abundant
Hieracium venosum	Veiny Hawkweed	43%	Occasional to Locally Abundant
Hylodesmum nudiflorum	Naked Tick-trefoil	36%	
Danthonia spicata	Poverty Oat-grass	29%	
Piptochaetium avenaceum	Eastern Needlegrass	29%	
Coreopsis major	Woodland Coreopsis	14%	
Hexastylis arifolia	Little Brown Jug	14%	
Pteridium aquilinum	Eastern Bracken	14%	
Coreopsis verticillata	Threadleaf Coreopsis	7%	
Epigaea repens	Trailing Arbutus	7%	
Goodyera pubescens	Downy Rattlesnake-orchid	7%	
Pityopsis graminifolia	Grass-leaved Golden-aster	7%	
Schizachyrium scoparium	Common Little Bluestem	7%	
Scutellaria incana	Skullcap	7%	
Sericocarpus linifolius	Narrow-leaf White-topped Aster	7%	
Solidago odora	Licorice Goldenrod	7%	
Vernonia acaulis	Ironweed	7%	
Tephrosia virginiana	Virginia Goat's-rue	0%	

Piedmont Flora by Natural Community
MONADNOCK FOREST - CEGL006281

Scientific Name	Common Name	CVS Constancy	Abundance
Dominant Trees:			
Quercus montana	Rock Chestnut Oak	100%	Abundant
Quercus alba	White Oak	100%	Moderately Abundant
Quercus velutina	Black Oak	89%	
Carya glabra	Pignut Hickory	67%	
Quercus coccinea	Scarlet Oak	67%	MOVE UP?
Pinus echinata	Shortleaf Pine	100%	Occasional to Locally Abundant
Quercus marilandica	Blackjack Oak	56%	
Quercus stellata	Post Oak	44%	
Carya tomentosa	Mockernut Hickory	33%	
Pinus virginiana	Virginia Pine	33%	
Quercus falcata	Southern Red Oak	11%	
Understory Trees:			
Acer rubrum	Eastern Red Maple	100%	Abundant
Oxydendrum arboreum	Sourwood	100%	
Nyssa sylvatica	Black Gum	89%	
Cornus florida	Flowering Dogwood	78%	Moderately Abundant
Diospyros virginiana	American Persimmon	67%	
Ilex opaca	American Holly	67%	
Vaccinium arboreum	Farkleberry	33%	Occasional to Locally Abundant
Shrubs:			
Vaccinium stamineum	Common Deerberry	100%	Abundant
Vaccinium pallidum	Hillside Blueberry	67%	Moderately Abundant
Vaccinium tenellum	Small Cluster Blueberry	56%	Occasional to Locally Abundant
Gaylussacia baccata	Black Huckleberry	11%	
Rhus copallinum	Winged Sumac	11%	
Vines:			
Smilax spp.	Greenbrier	100%	Abundant
Muscadinia rotundifolia	Muscadine	78%	Moderately Abundant
Toxicodendron radicans	Eastern Poison Ivy	22%	Occasional to Locally Abundant
Herbs:			
Chimaphila maculata	Pipsissewa	89%	Abundant
Hieracium venosum	Veiny Hawkweed	78%	Moderately Abundant
Danthonia spicata	Poverty Oat-grass	56%	Occasional to Locally Abundant
Coreopsis verticillata	Threadleaf Coreopsis	44%	
Hylodesmum nudiflorum	Naked Tick-trefoil	33%	
Tephrosia virginiana	Virginia Goat's-rue	33%	
Cunila origanoides	Stone-mint	22%	
Baptisia tinctoria	Honesty-weed	11%	
Epigaea repens	Trailing Arbutus	11%	
Solidago odora	Licorice Goldenrod	11%	
Pteridium aquilinum	Eastern Bracken	0%	
Schizachyrium scoparium	Common Little Bluestem	0%	

Attachment 6f

Piedmont Flora by Natural Community
BASIC MESIC FOREST - CEGL008466

Scientific Name	Common Name	CVS Constancy	Abundance
Dominant Trees:			
Liriodendron tulipifera	Tulip-tree	93%	Abundant
Fagus grandifolia	American Beech	87%	
Quercus rubra	Red Oak	87%	
Acer rubrum	Eastern Red Maple	87%	Moderately Abundant
Quercus alba	White Oak	87%	
Carya cordiformis	Bitternut Hickory	80%	
Fraxinus americana	White Ash	73%	
Carya glabra	Pignut Hickory	60%	Occasional to Locally Abundant
Acer floridanum	Southern Sugar Maple	53%	
Carya tomentosa	Mockernut Hickory	53%	
Liquidambar styraciflua	Sweet Gum	53%	
Carya ovata	Common Shagbark Hickory	47%	
Celtis laevigata	Southern Hackberry	47%	
Juglans nigra	Black Walnut	33%	
Quercus shumardii	Shumard Oak	27%	
Magnolia macrophylla	Bigleaf Magnolia	20%	
Understory Trees:			
Cornus florida	Flowering Dogwood	93%	Abundant
Prunus serotina	Black Cherry	93%	
Acer rubrum	Eastern Red Maple	87%	
Cercis canadensis	Eastern Redbud	87%	
Carpinus caroliniana	American Hornbeam	80%	
Ulmus alata	Winged Elm	73%	Moderately Abundant
Ulmus rubra	Slippery Elm	73%	
Asimina triloba	Common Pawpaw	67%	
Juniperus virginiana	Eastern Red Cedar	60%	
Morus rubra	Red Mulberry	60%	
Ostrya virginiana	American Hop-hornbeam	53%	Occasional to Locally Abundant
Acer negundo	Eastern Box Elder	47%	
Ilex opaca	American Holly	47%	
Nyssa sylvatica	Black Gum	47%	
Acer leucoderme	Chalk Maple	20%	
Shrubs:			
Euonymus americanus	Strawberry-bush	93%	Abundant
Viburnum acerifolium	Mapleleaf Viburnum	73%	Moderately Abundant
Lindera benzoin	Northern Spicebush	67%	
Viburnum prunifolium	Black Haw	47%	Occasional to Locally Abundant
Euonymus atropurpureus	American Wahoo	47%	
Corylus americana	American Hazelnut	33%	
Aesculus sylvatica	Painted Buckeye	27%	
Hydrangea arborescens	Smooth Hydrangea	27%	
Sambucus canadensis	Common Elderberry	27%	
Viburnum rafinesqueanum	Downy Arrow-wood	27%	
Viburnum rufidulum	Southern Black Haw	27%	
Hamamelis virginiana	Northern Witch-hazel	20%	
Calycanthus floridus	Sweet-shrub	13%	
Dirca palustris	Leatherwood	7%	
Philadelphus inodorus	Appalachian Mock-orange	7%	
Staphylea trifolia	Bladdernut	7%	
Physocarpus opulifolius	Eastern Ninebark	0%	
Styrax grandifolius	Bigleaf Snowbell	0%	
Vines:			
Parthenocissus quinquefolia	Virginia-creeper	100%	Abundant
Toxicodendron radicans	Eastern Poison Ivy	100%	
Bignonia capreolata	Cross-vine	73%	Moderately Abundant
Muscadinia rotundifolia	Muscadine	73%	
Smilax spp.	Greenbrier	67%	
Menispermum canadense	Moonseed	20%	Occasional to Locally Abundant
Herbs:			
Polygonatum biflorum	Small Solomon's-seal	100%	Abundant
Polystichum acrostichoides	Christmas Fern	100%	
Maianthemum racemosum	Eastern Solomon's-plume	93%	
Arisaema triphyllum	Common Jack-in-the-Pulpit	80%	
Galium circaezans	Southern Forest Bedstraw	73%	Moderately Abundant
Uvularia perfoliata	Perfoliate Bellwort	73%	
Geum canadense	White Avens	67%	
Actaea racemosa	Common Black-cohosh	60%	
Botrypus virginianus	Rattlesnake Fern	60%	
Endodeca serpentaria	Turpentine-root	60%	

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Piedmont Flora by Natural Community
DRY-MESIC BASIC OAK-HICKORY FOREST - CEGL007232

Scientific Name	Common Name	CVS Constancy	Abundance
Dominant Trees:			
Quercus alba	White Oak	100%	Abundant
Quercus rubra	Red Oak	91%	
Acer floridanum	Southern Sugar Maple	73%	Moderately Abundant
Carya tomentosa	Mockernut Hickory	73%	
Carya glabra	Pignut Hickory	64%	
Quercus velutina	Black Oak	64%	Occasional to Locally Abundant
Liriodendron tulipifera	Tulip-tree	55%	
Fraxinus americana	White Ash	55%	
Carya carolinae-septentrionalis	Carolina Shagbark Hickory	46%	
Liquidambar styraciflua	Sweet Gum	46%	
Carya ovalis	Red Hickory	36%	
Carya cordiformis	Bitternut Hickory	27%	
Carya ovata	Common Shagbark Hickory	18%	
Magnolia tripetala	Umbrella Magnolia	18%	
Pinus echinata	Shortleaf Pine	18%	
Juglans nigra	Black Walnut	9%	
Celtis laevigata	Southern Hackberry	0%	
Understory Trees:			
Cornus florida	Flowering Dogwood	100%	Abundant
Cercis canadensis	Eastern Redbud	82%	
Prunus serotina	Black Cherry	82%	
Acer rubrum	Eastern Red Maple	64%	Moderately Abundant
Diospyros virginiana	American Persimmon	55%	Occasional to Locally Abundant
Nyssa sylvatica	Black Gum	55%	
Ulmus alata	Winged Elm	46%	
Asimina triloba	Common Pawpaw	36%	
Juniperus virginiana	Eastern Red Cedar	36%	
Ostrya virginiana	American Hop-hornbeam	27%	
Chionanthus virginicus	Fringe-tree	18%	
Crataegus marshallii	Parsley Hawthorn	9%	
Acer leucoderme	Chalk Maple	0%	
Shrubs:			
Euonymus americanus	Strawberry-bush	55%	Occasional to Locally Abundant
Vaccinium stamineum	Common Deerberry	36%	
Viburnum prunifolium	Black Haw	36%	
Callicarpa americana	Beautyberry	18%	
Frangula caroliniana	Carolina Buckthorn	18%	
Viburnum acerifolium	Mapleleaf Viburnum	18%	
Viburnum rufidulum	Southern Black Haw	18%	
Aesculus sylvatica	Painted Buckeye	9%	
Rhus aromatica	Fragrant Sumac	9%	
Viburnum rafinesqueanum	Downy Arrow-wood	9%	
Calycanthus floridus	Sweet-shrub	0%	
Symphoricarpos orbiculatus	Coralberry	0%	
Vines:			
Muscadinia rotundifolia	Muscadine	100%	Abundant
Smilax spp.	Greenbrier	73%	Moderately Abundant
Parthenocissus quinquefolia	Virginia-creeper	64%	
Toxicodendron radicans	Eastern Poison Ivy	55%	Occasional to Locally Abundant
Bignonia capreolata	Cross-vine	27%	
Herbs:			
Dichanthelium boscii	Bosc's Witch Grass	73%	Moderately Abundant
Endodeca serpentaria	Turpentine-root	73%	
Galium circaezans	Southern Forest Bedstraw	73%	
Polygonatum biflorum	Small Solomon's-seal	55%	Occasional to Locally Abundant
Asplenium platyneuron	Ebony Spleenwort	36%	
Hexastylis arifolia	Little Brown Jug	36%	
Polystichum acrostichoides	Christmas Fern	36%	
Asclepias variegata	White Milkweed	27%	
Botrypus virginianus	Rattlesnake Fern	27%	
Melica mutica	Two-flower Melic	27%	
Uvularia perfoliata	Perfoliate Bellwort	27%	
Brachyelytrum erectum	Common Shorthusk	18%	
Chrysogonum virginianum	Green-and-gold	18%	
Maianthemum racemosum	Eastern Solomon's-plume	18%	
Phryma leptostachya	American Lopseed	18%	
Scleria oligantha	Few-flowered Nutrush	18%	
Carex pensylvanica	Sedge	9%	
Euphorbia corollata	Eastern Flowering Spurge	9%	
Eutrochium purpureum	Purple-node Joe-pye-weed.	9%	
Zephyranthes atamasca	Common Atamasco-lily	9%	
Carex albicans	Sedge	0%	
Carex nigromarginata	Blackedge Sedge	0%	
Elymus hystrix	Common Bottlebrush Grass	0%	
Elymus virginicus	Common Eastern Wild-rye	0%	
Phegopteris hexagonoptera	Broad Beech Fern	0%	
Zizia aurea	Common Golden-Alexanders	0%	

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Piedmont Flora by Natural Community
DRY BASIC OAK-HICKORY FOREST - CEGL007773

Scientific Name	Common Name	CVS Constancy	Abundance
Dominant Trees:			
Quercus stellata	Post Oak	89%	Abundant
Quercus alba	White Oak	89%	
Quercus falcata	Southern Red Oak	44%	
Fraxinus americana	White Ash	100%	Moderately Abundant
Carya glabra	Pignut Hickory	89%	
Carya tomentosa	Mockernut Hickory	89%	
Quercus velutina	Black Oak	78%	
Quercus rubra	Red Oak	89%	Occasional to Locally Abundant
Liquidambar styraciflua	Sweet Gum	67%	
Liriodendron tulipifera	Tulip-tree	56%	
Carya carolinae-septentrionalis	Carolina Shagbark Hickory	56%	
Carya ovata	Common Shagbark Hickory	33%	
Pinus echinata	Shortleaf Pine	22%	
Carya ovalis	Red Hickory	0%	
Understory Trees:			
Juniperus virginiana	Eastern Red Cedar	100%	Abundant
Cercis canadensis	Eastern Redbud	89%	
Prunus serotina	Black Cherry	89%	
Acer rubrum	Eastern Red Maple	89%	
Cornus florida	Flowering Dogwood	78%	Moderately Abundant
Diospyros virginiana	American Persimmon	78%	
Ulmus alata	Winged Elm	78%	
Ilex opaca	American Holly	67%	
Vaccinium arboreum	Farkleberry	56%	Occasional to Locally Abundant
Nyssa sylvatica	Black Gum	56%	
Acer floridanum	Southern Sugar Maple	44%	
Acer leucoderme	Chalk Maple	33%	
Chionanthus virginicus	Fringe-tree	33%	
Ilex decidua	Possum-haw	33%	
Ostrya virginiana	American Hop-hornbeam	22%	
Shrubs:			
Euonymus americanus	Strawberry-bush	89%	Abundant
Vaccinium stamineum	Common Deerberry	78%	Moderately Abundant
Rosa carolina	Carolina Rose	67%	
Vaccinium pallidum	Hillside Blueberry	44%	Occasional to Locally Abundant
Viburnum rufidulum	Southern Black Haw	33%	
Frangula caroliniana	Carolina Buckthorn	11%	
Rhus aromatica	Fragrant Sumac	11%	
Symphoricarpos orbiculatus	Coralberry	11%	
Viburnum acerifolium	Mapleleaf Viburnum	11%	
Viburnum rafinesqueanum	Downy Arrow-wood	11%	
Vines:			
Muscadinia rotundifolia	Muscadine	100%	Abundant
Parthenocissus quinquefolia	Virginia-creeper	100%	
Smilax spp.	Greenbrier	89%	
Toxicodendron radicans	Eastern Poison Ivy	56%	Occasional to Locally Abundant
Lonicera sempervirens	Coral honeysuckle	56%	
Gelsemium sempervirens	Carolina Jessamine	33%	
Herbs:			
Asplenium platyneuron	Ebony Spleenwort	89%	Abundant
Galium circaezans	Southern Forest Bedstraw	78%	Moderately Abundant
Danthonia spicata	Poverty Oat-grass	67%	
Endodeca serpentaria	Turpentine-root	67%	
Uvularia perfoliata	Perfoliate Bellwort	67%	
Piptochaetium avenaceum	Eastern Needlegrass	56%	Occasional to Locally Abundant
Scleria oligantha	Few-flowered Nutrush	56%	
Malanthemum racemosum	Eastern Solomon's-plume	56%	
Melica mutica	Two-flower Melic	44%	
Passiflora lutea	Eastern Yellow Passionflower	44%	
Polystichum acrostichoides	Christmas Fern	44%	
Asclepias variegata	White Milkweed	33%	
Euphorbia corollata	Eastern Flowering Spurge	33%	
Cunila origanoides	Stone-mint	22%	
Polygonatum biflorum	Small Solomon's-seal	22%	
Carex nigromarginata	Blackedge Sedge	11%	
Carex pensylvanica	Sedge	11%	
Clematis ochroleuca	Curlyheads	11%	
Coreopsis major	Woodland Coreopsis	11%	
Coreopsis verticillata	Threadleaf Coreopsis	11%	
Dryopteris marginalis	Marginal Wood-fern	11%	
Carex albicans	Sedge	0%	

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Piedmont Flora by Natural Community
XERIC HARDPAN FOREST - CEGL003714

Scientific Name	Common Name	CVS Constancy	Abundance	
Dominant Trees:				
Quercus stellata	Post Oak	100%	Abundant	
Carya glabra	Pignut Hickory	71%	Moderately Abundant	
Fraxinus americana	White Ash	71%		
Carya carolinae-septentrionalis	Carolina Shagbark Hickory	64%		
Quercus phellos	Willow Oak	71%	Occasional to Locally Abundant	
Liquidambar styraciflua	Sweet Gum	50%		
Quercus alba	White Oak	50%		
Carya tomentosa	Mockernut Hickory	43%		
Quercus rubra	Red Oak	43%		
Quercus velutina	Black Oak	43%		
Carya ovata	Common Shagbark Hickory	36%		
Quercus marilandica	**Blackjack Oak**	**36%**	MOVE?	**CONSIDER MOVING TO ABUNDANT; SPIRA**
Pinus echinata	Shortleaf Pine	29%		
Pinus virginiana	Virginia Pine	14%		
Understory Trees:				
Ulmus alata	Winged Elm	100%	Abundant	
Juniperus virginiana	Eastern Red Cedar	93%		
Prunus serotina	Black Cherry	79%	Moderately Abundant	
Diospyros virginiana	American Persimmon	71%		
Acer rubrum	Eastern Red Maple	57%	Occasional to Locally Abundant	
Vaccinium arboreum	Farkleberry	57%		
Cornus florida	Flowering Dogwood	43%		
Nyssa sylvatica	Black Gum	43%		
Chionanthus virginicus	Fringe-tree	36%		
Ilex decidua	Possum-haw	36%		
Cercis canadensis	Eastern Redbud	29%		
Acer leucoderme	Chalk Maple	21%		
Prunus americana	Wild Plum	7%		
Shrubs:				
Vaccinium stamineum	Common Deerberry	50%	Occasional to Locally Abundant	
Rosa carolina	Carolina Rose	43%		
Viburnum prunifolium	Black Haw	43%		
Hypericum hypericoides	St. Andrew's Cross	29%		
Rhus aromatica	Fragrant Sumac	29%		
Vaccinium tenellum	Small Cluster Blueberry	29%		
Viburnum rufidulum	Southern Black Haw	14%		
Rhus copallinum	Winged Sumac	14%		
Manfreda virginica	Rattlesnake-master	14%		
Vaccinium pallidum	Hillside Blueberry	7%		
Viburnum rafinesqueanum	Downy Arrow-wood	7%		
Symphoricarpos orbiculatus	Coralberry	0%		
Vines:				
Muscadinia rotundifolia	Muscadine	100%	Abundant	
Toxicodendron radicans	Eastern Poison Ivy	79%	Moderately Abundant	
Parthenocissus quinquefolia	Virginia-creeper	79%		
Smilax spp.	Greenbrier	71%		
Campsis radicans	Trumpet-creeper	57%	Occasional to Locally Abundant	
Lonicera sempervirens	Coral honeysuckle	50%		
Thrysanthella difformis	Climbing Dogbane	36%		
Herbs:				
Danthonia spicata	Poverty Oat-grass	71%	Moderately Abundant	
Asplenium platyneuron	Ebony Spleenwort	57%	Occasional to Locally Abundant	
Endodeca serpentaria	Turpentine-root	43%		
Piptochaetium avenaceum	Eastern Needlegrass	43%		
Hieracium venosum	Veiny Hawkweed	21%		
Polygonatum biflorum	Small Solomon's-seal	21%		
Coreopsis major	Woodland Coreopsis	14%		
Coreopsis verticillata	Threadleaf Coreopsis	14%		
Lespedeza spp.	Lespedeza	14%		
Oenothera fruticosa	Southern Sundrops	14%		
Clematis ochroleuca	Curlyheads	7%		
Marshallia obovata	Piedmont Barbara's-buttons	7%		
Muhlenbergia capillaris	Hairgrass	7%		
Packera anonyma	Appalachian Ragwort	7%		
Physostegia virginiana	Obedient-plant	7%		
Pityopsis graminifolia	Grass-leaved Golden-aster	7%		
Sericocarpus linifolius	Narrow-leaf White-topped Aster	7%		
Vernonia acaulis	Ironweed	7%		
Baptisia tinctoria	Honesty-weed	0%		
Hieracium gronovii	Beaked Hawkweed	0%		
Liatris pilosa	Shaggy Blazing-star	0%		
Schizachyrium scoparium	Common Little Bluestem	0%		
Solidago nemoralis	Eastern Gray Goldenrod	0%		
Solidago odora	Licorice Goldenrod	0%		
Symphyotrichum dumosum	Long-stalked Aster	0%		

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Piedmont Flora by Natural Community
ALLUVIAL FOREST - CEGL004418

Scientific Name	Common Name	CVS Constancy	Abundance
Dominant Trees:			
Liriodendron tulipifera	Tulip-tree	100%	Abundant
Liquidambar styraciflua	Sweet Gum	91%	
Betula nigra	River Birch	66%	
Celtis laevigata	Southern Hackberry	59%	
Platanus occidentalis	Sycamore	41%	
Acer rubrum	Eastern Red Maple	88%	Moderately Abundant
Fraxinus pennsylvanica	Green Ash	69%	
Quercus alba	White Oak	69%	
Fagus grandifolia	American Beech	66%	
Juglans nigra	Black Walnut	63%	
Carya cordiformis	Bitternut Hickory	53%	Occasional to Locally Abundant
Quercus rubra	Red Oak	41%	
Carya tomentosa	Mockernut Hickory	34%	
Carya ovata	Common Shagbark Hickory	31%	
Quercus shumardii	Shumard Oak	31%	
Ulmus americana	American Elm	22%	
Understory Trees:			
Cornus florida	Flowering Dogwood	94%	Abundant
Prunus serotina	Black Cherry	91%	
Acer rubrum	Eastern Red Maple	88%	
Carpinus caroliniana	American Hornbeam	88%	
Ilex opaca	American Holly	88%	
Juniperus virginiana	Eastern Red Cedar	69%	Occasional to Locally Abundant
Acer floridanum	Southern Sugar Maple	50%	
Morus rubra	Red Mulberry	47%	
Ulmus alata	Winged Elm	47%	
Cercis canadensis	Eastern Redbud	44%	
Acer negundo	Eastern Box Elder	40%	
Diospyros virginiana	American Persimmon	38%	
Nyssa sylvatica	Black Gum	38%	
Oxydendrum arboreum	Sourwood	38%	
Ilex decidua	Possum-haw	34%	
Ostrya virginiana	American Hop-hornbeam	34%	
Asimina triloba	Common Pawpaw	31%	
Ulmus rubra	Slippery Elm	31%	
Shrubs:			
Euonymus americanus	Strawberry-bush	88%	Abundant
Lindera benzoin	Northern Spicebush	63%	Moderately Abundant
Viburnum prunifolium	Black Haw	56%	Occasional to Locally Abundant
Sambucus canadensis	Common Elderberry	31%	
Corylus americana	American Hazelnut	25%	
Aesculus sylvatica	Painted Buckeye	16%	
Arundinaria gigantea	Giant Cane	16%	
Calycanthus floridus	Sweet-shrub	13%	
Staphylea trifolia	Bladdernut	13%	
Alnus serrulata	Tag Alder	9%	
Cornus amomum	Silky Dogwood	9%	
Xanthorhiza simplicissima	Yellowroot	9%	
Corylus cornuta	Beaked Hazelnut	3%	
Itea virginica	Virginia-willow	0%	
Physocarpus opulifolius	Eastern Ninebark	0%	
Amorpha fruticosa	Tall Indigo-bush	0%	
Vines:			
Parthenocissus quinquefolia	Virginia-creeper	100%	Abundant
Muscadinia rotundifolia	Muscadine	97%	
Toxicodendron radicans	Eastern Poison Ivy	97%	
Smilax spp.	Greenbrier	88%	
Campsis radicans	Trumpet-creeper	78%	Moderately Abundant
Bignonia capreolata	Cross-vine	59%	Occasional to Locally Abundant
Clematis virginiana	Virgin's-bower	19%	
Menispermum canadense	Moonseed	16%	
Herbs:			
Polystichum acrostichoides	Christmas Fern	97%	Abundant
Viola spp.	Violet	91%	
Hexastylis arifolia	Little Brown Jug	34%	Abundant in MM
Podophyllum peltatum	May-apple	34%	Abundant in MM
Tiarella cordifolia	Heartleaf Foamflower	13%	Abundant in MM
Claytonia virginica	Spring-beauty	0%	

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Piedmont Flora by Natural Community
BOTTOMLAND FOREST - CEGL007356,7006

Scientific Name	Common Name	CVS Constancy	Abundance
Dominant Trees:			
Quercus phellos	Willow Oak	79%	Abundant
Quercus michauxii	Basket Oak	58%	
Quercus pagoda	Cherrybark Oak	55%	
Quercus lyrata	Overcup Oak	39%	Moderately Abundant
Quercus nigra	Water Oak	39%	
Quercus alba	White Oak	36%	
Liquidambar styraciflua	Sweet Gum	97%	Occasional to Locally Abundant
Fraxinus pennsylvanica	Green Ash	82%	
Liriodendron tulipifera	Tulip-tree	52%	
Ulmus americana	American Elm	52%	
Carya ovata	Common Shagbark Hickory	46%	
Celtis laevigata	Southern Hackberry	46%	
Carya cordiformis	Bitternut Hickory	36%	
Acer negundo	Eastern Box Elder	30%	
Quercus shumardii	Shumard Oak	27%	
Fagus grandifolia	American Beech	27%	
Understory Trees:			
Acer rubrum	Eastern Red Maple	97%	Abundant
Ilex decidua	Possum-haw	94%	
Carpinus caroliniana	American Hornbeam	82%	
Ulmus alata	Winged Elm	70%	Moderately Abundant
Nyssa sylvatica	Black Gum	64%	
Ulmus rubra	Slippery Elm	61%	
Acer floridanum	Southern Sugar Maple	52%	Occasional to Locally Abundant
Ilex opaca	American Holly	49%	
Cornus florida	Flowering Dogwood	36%	
Diospyros virginiana	American Persimmon	33%	
Asimina triloba	Common Pawpaw	30%	
Shrubs:			
Euonymus americanus	Strawberry-bush	73%	Moderately Abundant
Viburnum prunifolium	Black Haw	70%	
Lindera benzoin	Northern Spicebush	30%	Occasional to Locally Abundant
Aesculus sylvatica	Painted Buckeye	27%	
Viburnum dentatum	Arrow-wood	27%	
Arundinaria gigantea	Giant Cane	24%	
Sambucus canadensis	Common Elderberry	21%	
Hypericum hypericoides	St. Andrew's Cross	18%	
Cornus amomum	Silky Dogwood	9%	
Cephalanthus occidentalis	Buttonbush	6%	
Vines:			
Toxicodendron radicans	Eastern Poison Ivy	100%	Abundant
Campsis radicans	Trumpet-creeper	91%	
Parthenocissus quinquefolia	Virginia-creeper	91%	
Smilax spp.	Greenbrier	91%	
Bignonia capreolata	Cross-vine	79%	Moderately Abundant
Muscadinia rotundifolia	Muscadine	76%	
Gelsemium sempervirens	Carolina Jessamine	24%	Occasional to Locally Abundant
Menispermum canadense	Moonseed	6%	
Herbs:			
Podophyllum peltatum	May-apple	9%	Abundant
Tiarella cordifolia	Heartleaf Foamflower	3%	
Hexastylis arifolia	Little Brown Jug		
Claytonia virginica	Spring-beauty	0%	
Erythronium umbilicatum	Dimpled Trout Lily	0%	
Boehmeria cylindrica	False-nettle	73%	Moderately Abundant
Viola spp.	Violet	73%	
Arisaema triphyllum	Common Jack-in-the-Pulpit	61%	
Glyceria striata	Fowl Mannagrass	49%	Occasional to Locally Abundant
Carex tribuloides	Sedge	45%	
Saururus cernuus	Lizard's-tail	42%	
Carex radiata	Sedge	39%	
Elymus virginicus	Common Eastern Wild-rye	39%	
Persicaria virginiana	Jumpseed	39%	
Lycopus virginicus	Virginia Bugleweed	33%	
Chasmanthium latifolium	River Oats	30%	
Polystichum acrostichoides	Christmas Fern	30%	
Mitchella repens	Partridge-berry	27%	
Solidago caesia	Axillary Goldenrod	24%	

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Attachment 6l

Piedmont Flora by Natural Community
UPLAND DEPRESSION SWAMP FOREST - CEGL007403

Scientific Name	Common Name	CVS Constancy	Abundance
Dominant Trees:			
Quercus phellos	**Willow Oak**	**100%**	Abundant
Liquidambar styraciflua	Sweet Gum	88%	
Quercus stellata	Post Oak	36%	Occasional to Locally Abundant
Fraxinus pennsylvanica	Green Ash	32%	
Quercus alba	White Oak	32%	
Carya carolinae-septentrionalis	Carolina Shagbark Hickory	28%	
Fraxinus americana	White Ash	28%	
Liriodendron tulipifera	Tulip-tree	24%	
Quercus lyrata	Overcup Oak	20%	
Carya ovata	Common Shagbark Hickory	12%	
Quercus michauxii	Basket Oak	8%	
Ulmus americana	American Elm	8%	
Quercus bicolor	Swamp White Oak	0%	
Understory Trees:			
Acer rubrum	Eastern Red Maple	76%	Moderately Abundant
Ulmus alata	Winged Elm	76%	
Nyssa sylvatica	Black Gum	68%	
Diospyros virginiana	American Persimmon	64%	
Ilex decidua	Possum-haw	24%	Occasional to Locally Abundant
Shrubs:			
Hypericum hypericoides	St. Andrew's Cross	36%	Occasional to Locally Abundant
Vaccinium fuscatum	Hairy Highbush Blueberry	32%	
Cephalanthus occidentalis	Buttonbush	20%	
Ilex verticillata	Winterberry	12%	
Aronia arbutifolia	Red Chokeberry	4%	
Itea virginica	Virginia-willow	4%	
Viburnum dentatum	Arrow-wood	4%	
Vines:			
Smilax spp.	Greenbrier	68%	Moderately Abundant
Campsis radicans	Trumpet-creeper	64%	
Muscadinia rotundifolia	Muscadine	64%	
Thrysanthella difformis	Climbing Dogbane	60%	
Toxicodendron radicans	Eastern Poison Ivy	48%	Occasional to Locally Abundant
Parthenocissus quinquefolia	Virginia-creeper	40%	
Gelsemium sempervirens	Carolina Jessamine	12%	
Bignonia capreolata	Cross-vine	8%	
Herbs:			
Carex joorii	Joor's Sedge	48%	Occasional to Locally Abundant
Danthonia spicata	Poverty Oat-grass	48%	
Climacium americanum - nonvascular	Tree Moss	32%	
Asplenium platyneuron	Ebony Spleenwort	24%	
Sphagnum lescurii - nonvascular	Lescur's Sphagnum	24%	
Chasmanthium laxum	Slender Spikegrass	20%	
Carex intumescens	Greater Bladder Sedge	16%	
Juncus coriaceus	Leathery Rush	16%	
Mitchella repens	Partridge-berry	12%	
Carex albolutescens	Greenwhite Sedge	8%	
Glyceria striata	Fowl Mannagrass	8%	
Zephyranthes atamasca	Common Atamasco-lily	8%	
Eutrochium fistulosum	Hollow-stem Joe-pye-weed	4%	
Glyceria septentrionalis	Floating Mannagrass	4%	
Pycnanthemum tenuifolium	Wild-basil	4%	
Eleocharis tenuis	Slender Spikerush	0%	
Juncus effusus	Common Rush	0%	
Claytonia virginica	Spring-beauty	0%	
Eupatorium perfoliatum	Boneset	0%	
Lycopodioides apodum	Meadow Spikemoss	0%	
Spiranthes cernua	Nodding Ladies'-tresses	0%	

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