

Workbook: Biodiversity of the Potomac Valley
(2009, March 2017, a work-in-progress still in need of editing, additions, corrections, etc.)

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Our Goals

Increase your scientific literacy in view of wise voting and total Earth Stewardship.
Learn about local biodiversity.
Learn about local plant communities.
Pool our knowledge and update this workbook as a group.

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**This Workbook**

I started this little workbook in 2009 and update it over the years. This workbook is primarily an annotated list of local biota. I include selected information for each taxon. For full information you should consult reference books and scientific papers, some of which I list in the Literature parts of this handbook, and even Wikipedia. For some species, I include information from my forest ecology courses, such as specific ecological roles in forests.

Please give me corrections, additions, suggestions, etc.

A wonderful introduction to the biota of the U.S. Mid-Atlantic Region is

Alden, P., B. Cassie, J. D. W. Kahl, E. A. Oches, H. Zirlin, and W. B. Zomlefer. 2007. National Audubon Society. Field Guide to the Mid-Atlantic States. Alfred A. Knopf, New York, NY. 448 pp.

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Background

How do many biologists now classify life from large through small taxonomic groups (= taxa)?

(domain, phylum, class, order, family, genus, species, subspecies (variety and forma in plants) and categories between the larger categories)

Table 1. Some Large Divisions of Life on Earth.

Taxon	English name	Approximate number of species	Examples
Domain Archaea	Archaeans	hundreds	Methanogens
Domain Bacteria	Bacteria	millions	Human Gut Bacteria, Staphylococci, Streptococci
Domain Eukarya	Eucaryans	millions	

Kingdom Animalia	Animals	millions	Metazoans, Sponges, Flatworms, Roundworms, Arthropods, Echinoderms, Urochordates, Hemichordates, Cephalochordates, Chordates
Kingdom Fungi	Fungi	thousands	Ascomycetes, Basidiomycetes
Kingdom Plantae	Plants	thousands	Mosses, Horsetails, Clubmosses, Ferns, Gymnosperms, Angiosperms
Kingdom Protozoa, sensu lato	Protozoans	thousands	Algae, Euglenoids, Plasmodia, Trypanosomes

Note: There are likely over 20,000 species in the the Washington, D.C., Area. Due to time and space limitations, I include only some of these fascinating taxa below. The lists below emphasize the Potomac Valley Area. Species counts are from Brown and Brown 1972, 1984, and other sources.

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 Disclaimers, Etc.

The lists below are conglomerations from bioblitz lists, lists from my forest ecology course, and other lists. I have not yet had time to insert all known English names, italicize all names, etc. Further, this list is obviously very incomplete. I may need to update some scientific names and include some missing English names. I include full names of some of the taxon authors for fun.

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Organism Consumption. I am not responsible for anyone who consumes anything on my field trips.

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Antianthropocentrism and Demystifying Organism Names — Plants

E. M. Barrows (March 2009, written for Friends of Dyke Marsh)

People have given organisms many names, both proper names in Chinese, English, French, German, Indian, Japanese, Russian, and so forth and scientific names. These thousands of names and rules of English and binomial nomenclature confuse many of us. At Georgetown University, students learn some classical biology in my course in forest ecology when I present a learning module called “Demystifying Organism Names.” Some students are surprised that there are rules of binomial nomenclature and the rules differ among taxonomic groups as well as some other facts about organism names. I’ll say just a little about plant names here.

For example, a plant that I usually call Pawpaw or *Asimina triloba* is also called the Common Pawpaw, Custard-apple (in Central USA), Hoosier-banana (Ohio), Michigan-banana (Michigan), Poor Man's-banana, and West-Virginia-banana (West Virginia). It likely has some Native American names as well. The Pawpaw’s full scientific name is *Asimina triloba* (Linnaeus) Dunal, 1817. “*Asimina*” is its generic name, and “*triloba*” is its specific epithet. Why are human names attached to this plant’s scientific name? Carolus Linnaeus, the father of binomial nomenclature, originally named this plant. In 1817, Felix Michel Dunal (French biologist, 1789–1856) published his work that reclassified Pawpaw into its current genus (*Asimina*). By botanical taxonomic convention, the first author to name this plant (Linnaeus) went into parentheses.

You might have noticed that I wrote Common Pawpaw, Custard-apple, Hoosier-banana, Michigan-banana, Poor Man's-banana, and West-Virginia-banana instead of common pawpaw, custard apple, and Hoosier banana, Michigan banana, poor man’s banana, and West Virginia banana, respectively. Why the capitalized names? Some biologists including myself consider the so called common names of plants, in truth, to be proper English names (that is, proper nouns). Each of the above English names stands for a total species — the Pawpaw. Why the hyphens? Well, I’m an admitted hyphenist and a commaist for enhanced-communication reasons. Regarding the hyphens, I follow the lead of some prominent botanists (e.g., Stanwyn G. Shetler) who evidently think we should use English names that indicate true botanical taxonomy of plants (Barrows 2001; Shetler and Orli 2001, 2002). Pawpaw is in the Custard-apple Family (Annonaceae), not the Rose Family (which includes apple species) or the Banana Family (which includes the Bananas, and Birds-of-Paradise, and Traveler’s-palms). Therefore, we should indicate that Pawpaw is not an apple or a banana through hyphenation or joining words. For example, we could write “Custard-apple” or “Custardapple.” Further, I use a proper noun such as “Bananas,” as a synonym for the genus *Musa* which includes all Banana species of the world. If all of these names and rules are driving you bananas and bandanas, you are likely not alone!

Finally, I respectfully consider the use of proper nouns for organism names to be means of paying homage to biodiversity and a mental move away from too much rampant, and even destructive, anthropocentrism that we constantly perceive around us. Why should we make the name of just one individual of one of the millions of species on Earth such as Roger Tory Peterson a proper noun, yet not capitalize the name of entire species? To me, species of Dyke Marsh Wildlife Preserve should have biodiversity-homage English names. Anyone for Bald Eagle, Bulbous Earwigfly, European Earwig, and Eastern Flowering Dogwood?

References

Barrows, E. M. 2001. Animal Behavior Desk Reference. A Dictionary of Animal Behavior, Ecology, and Evolution. Second Edition. CRC Press LCC, Boca Raton, FL. 922 pp.

Shetler, S. G. and S. S. Orli. 2000. Annotated Checklist of the Vascular Plants of the Washington-Baltimore Area. Part I. Ferns, Fern Allies, Gymnosperms, and Dicotyledons. Smithsonian Institution (National Museum of Natural History, Department of Botany), Washington, D.C. 186 pp.

Shetler, S. G. and S. S. Orli. 2002. Annotated Checklist of the Vascular Plants of the Washington-Baltimore Area. Part II. Monocotyledons. Smithsonian Institution (National Museum of Natural History, Department of Botany), Washington, D.C. 95 pp.

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Abbreviations and Definitions

BB 1972 = Brown and Brown 1972 (woody plants of MD)  
BB 1984 = Brown and Brown 1984 (herbaceous plants of MD)  
BI = Bear Island, MD.  
BWA = Baltimore-Washington Area.

CBF = Chain Bridge Flats, MD.

DMWP = Dyke Marsh Wildlife Preserve, VA.

fb = full bloom.  
FCSP = Florida Caves State Park, Florida.  
forb = a nonwoody plant that is not in the families Cyperaceae, Juncaceae, and Poaceae.  
FtD = Fort Davis, WDC.

GAP = Glover Archbold Park, WDC.  
GEH = Glen Echo Heights, MD.  
GFMD = Great Falls Area, MD.  
GFVA = Great Falls Area, VA.  
grass = a plant in the Family Cyperaceae, Juncaceae, or Poaceae.

*Magnolia ×soulangiana* (Saucer Magnolia). The × joined to *soulangiana* indicates that this plant is a hybrid.  
MD = Maryland.

PIA = Plummers Island and adjacent Mainland.  
pers. comm. = personal communication.  
pers. obs. = personal observation.

sp. = 1 species.  
spp. = more than 1 species.

Tree = a woody plant that can grow 15 feet tall or taller.  
TRP = Turkey Run Park, VA.

VA = Virginia.

WDC = Washington, D.C.  
WDCA = Washington, D.C., Area (which includes WDC, Arlington County, Fairfax County, Montgomery County, Prince Georges County, and the City of Alexandria).

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Part 2. Archaea (Campbell and Reece 2005, 543–544). I know of no list for Archaea of the WDCA.

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Clade Euryarhaeota (Greek *eury*s, broad in reference to the broad habitat range of this clade. All methanogen species are in this clade.)

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extreme thermophiles (some species)

methanogen species
animal-gut methanogen species
marsh methanogen species
sewage-treatment-plant methanogen species
swamp methanogen species

non-extremophiles (many spp.)

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Clade Crenarchoaeota (Greek? Cren, spring of water)

extreme thermophiles (many spp.)  
non-extremophiles (many spp.)

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Clade Korarchaeota (tiny archaeans with only 500,000 base pairs in their genomes, in Icelandic hydrothermal vents)

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Clade Nanoarchaeota (Greek nanos, dwarf, at least 4 species based on DNA analysis)

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Table 3. Bacteria (Campbell and Reece 2005, chapter 27.)

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Lists: PI (Drouet 1953, cyanobacteria)

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Notes:

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Humans each carry about 4000 bacterial species, and there is bacterial succession in individuals throughout our lives  
Bacteria perform all ecosystem functions, except for producing major ecosystem architecture, pollination, seed dispersal, and perhaps other things.

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Propionobacteria sp. (Human body-odor Bacterium)

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Group Proteobacteria

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Subgroup Alpha Proteobacteria
Subgroup Beta Proteobacteria
Subgroup Gamma Proteobacteria
Subgroup Delta Proteobacteria
Subgroup Epsilon Proteobacteria

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Group Chlamydias  
Group Cyanobacteria  
Group Gram-positive bacteria  
Group Spirochetes

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Group Proteobacteria (All are gram-negative.)

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Subgroup Alpha Proteobacteria

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Agrobacterium spp. (plant-tumor-producing bacteria)
Rhizobium spp. (Legume symbionts, nitrogen-fixing bacteria)

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Subgroup Beta Proteobacteria

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Nitrosomonas spp. (Soil bacteria that oxidize ammonium and produce nitrite as a waste product.)

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Subgroup Gamma Proteobacteria

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Chromatium spp. (Sulfur Bacteria which obtain energy by oxidizing Hydrogen Sulfide and produce Sulfur as a waste product.)
Escherichia coli, Mammal-gut Bacterium, "E. coli"
Legionella (Legionnaires' Disease Bacterium, causative agent)
Salmonella (Food-poisoning Bacterium, causative agent)
Salmonella typhi (Typhoid Fever Bacterium)
Vibrio cholerae (Cholera Bacterium, causative agent)

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Iron Bacterium (in this subgroup?)

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Subgroup Delta Proteobacteria

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Slime-secreting Myxobacteria ("Slime-molds", including *Chondromyces crocatus*). Some people place Myxobacteria into Protozoa.)  
*Bdellovibrio* spp. (Consume other bacteria.)

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Subgroup Epsilon Proteobacteria (Most species are animal pathogens.)

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*Campylobacter* (causes blood poisoning and intestinal inflammation)  
*Helicobacter pylori* (Stomach-ulcer Bacterium, causative agent)

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Group Chlamydias

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*Chlamydia trachomatis* (the most common cause of human blindness worldwide and the cause of nongonococcal urethritis, the most common sexually transmitted disease in the USA)

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Group Cyanobacteria (Photoautotrophs, possible source of the first chloroplast)

Anabaena sp.
Oscillatoria sp. (filamentous)

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Group Gram-positive bacteria (A very large diverse group.)

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Subgroup Acinomyces (Greek myuks, fungus)

Bacillus anthracis (Anthrax Bacterium, causative agent)
Clostridium botulinum (Botulism Bacterium, causative agent)
Leprosy Bacterium
Staphylococcus epidermidis (Human Body-odor Bacterium)
Staphylococcus spp. (a total of about 33 spp.)
Streptococcus spp.
Streptomyces (soil-dwelling bacteria, sources of many antibiotics including Streptomycin)
Tuberculosis Bacterium
Many free-living species, including many decomposers that produce geosmin (“earth odor”)

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Subgroup Mycoplasma (tiny bacteria, without cell walls)

*Mycoplasma genitalium* (only 517 genes)  
*Mycoplasma pneumoniae* (Human Walking-pneumonia Bacterium)  
Many free-living soil spp.

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Group Spirochetes

Many free-living spp.
Borrelia burgdorferi (Lyme Disease Bacterium)
Treponema pallidum (Syphilis Bacterium)

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Glossary

geosmin *n.* An organic compound (4,8a-dimethyl-decahydronaphthalen-4a-ol, IUPAC name) with a distinctive earthy taste and odor (Johnsen and Bett 1996, 21).

*cf.* petrichor

*Comments:* Geosmin causes the earthy taste of *Beta vulgaris* (Beets) which they can produce independently of microorganisms (Lu et al. 2003, 1026) and contributes to the strong scent that occurs in air when rain falls after a dry spell. Humans are extremely sensitive to the odor of geosmin. Actinobacteria (especially *Streptomyces* spp.) and Cyanobacteria produce geosmin (Tabachek and Yurkowski 1976, 25; Izaguirre et al. 1982, 708; Gust et al. 2003, 1541). Some cyanobacterium species produce both geosmin and 2-methylisoborneol which both give water an unpleasant taste. Geosmin causes the muddy smell of bottom-dwelling, freshwater fish such as Carp and some catfish species. [Greek *geo*, Earth + *osme*, smell]

petrichor *n.* An argillaceous odor that accompanies rains after a warm, dry period (Bear and Thomas 1964, 993; 1966, 869).

*Comment:* Petrichor likely derives from atmospheric contaminants such as carotenoids, lipids, and terpenes (Bear and Thomas 1966, 869). Clays and rocks adsorb these compounds and their oxygenated derivatives which transform especially during warm through hot conditions. When the relative humidity of the atmosphere approaches saturation, the odorous, volatile compounds move into the air. Petrichor and geosmin (*q.v.*) produce an odor that many people consider pleasant and refreshing (Bear and Thomas 1966, 869). [Greek *petros*, stone, *ichor*, serum, watery part of blood; coined by Bear and Thomas 1965]

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Part 3A. Eucarya: Animals: Invertebrates except Arthropoda.

Lists: DMWP (Johnston 2000): 35 species of freshwater molluscs; Potomac Gorge (Evans 2008, 2006 Bioblitz).

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Phylum Annelida, Annelids (Earthworms and kin)

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Phylum Mollusca, Molluscs (Clams, Oysters, Slugs, Snails, and kin)

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Class Bivalvia: Order Veneroida: Family Corbiculidae: *Corbicula fluminea* (Muller, 1774), Asian Clam (many synonyms). A major, alien, invasive species. “*Corbicula fluminea* is a freshwater clam that has caused millions of dollars worth of damage to intake pipes used by power, water, and other industries. Many native clams are declining as *C. fluminea* out competes them for food and space. *C. fluminea* requires well-oxygenated waters and prefers fine, clean sand, clay, and coarse sand substrates. *C. fluminea* spreads when it is attached to boats or carried in ballast water, used as bait, sold through the aquarium trade, and carried with water currents” (<http://www.issg.org/database/species/ecology.asp?si=136&fr=1&sts=>).

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Class Gastropoda (gastropods, slugs, and snails) ((Evans2008, 2006 Potomac Gorge Bioblitz, 28)

Order Stylommatophora (terrestrial snails and slugs)

Family Punctidae: *Punctum smithi*, Lamellate Spot (snail). A rare, tiny land snail. Potomac Gorge BioBlitz 2006.

http://animaldiversity.ummz.umich.edu/site/accounts/classification/path/Punctum_smithi.html

Family Punctidae: *Potomapsis lapideria*. A semi-aquatic snail. Potomac Gorge BioBlitz 2006. Not in Google, June 26, 2006.

Family Punctidae: *Fontigens bottimeri*, Appalachian Spring Snail. G2, S2. Potomac Gorge seep, BioBlitz 2006. <http://www.dnr.state.md.us/wildlife/rte/rte04wash.pdf>

Land Snails (Arnold Norden in Evans 2008, 28).

Kend Hotopp found 27 species in 2005.

Norden (2008) published a review of the land snails of Plummers Island, MD. He found 3 introduced slug species and 1 introduced slug-species complex.

Arnold Norden and his bioblitz team found 35 species of land snails and 2 freshwater-mussel species (Norden in Evans 2008, 29).

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Phylum Plathymelminthes (Arnold Norden in Evans 2008, 28)

Order Polycladida: Dugesidae: 4 species found. Mr. Norden expects that 2 more species occur in the Potomac Gorge Area.

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Table 4B. Eucarya: Animalia: Arthropoda

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Phylum Arthropoda, Arthropods

Lists: DMWP (Kjar and Barrows, 2004, some forest species), PI (Krombein 1963, wasps; Leonard 1966, aphids; Wirth and Grogan 1981, ceratopogonid midges; Erwin 1981, carabid beetles; Brown 2001, tortricid moths; Brown et al. 2008, Lepidoptera; Vann 2008, butterflies), WDCA (Clark 1932, butterflies)

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Subphylum Atelocerata (Insects and Kin)

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Class Arachnida (Spiders and Kin)

Barbara J. Abraham and her team found 45 species of arachnids during the 2006 Bioblitz (Evans 2008, 37). This includes spiders in 11 families

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Class Insecta (Insects).

Order Coleoptera (Beetles): Dr. Arthur V. Evans and his team collected 302 species in 54 families during the 2006 Bioblitz (Evans 2008, 45).

Cantharidae (Soldier Beetles): *Chauiognathus pennsylvanicus* (Pennsylvania Leatherwing) prey on eggs and larvae of other insects as larvae. Adults prey on aphids and other insects and pollinate some plant species such as goldenrods.

Carabidae (Ground Beetles) are predators of forest insects including the native Eastern Forest Tent-caterpillar and invasive Gypsy Moth. Note one specimen is a ground beetle in this course.

Cerambycidae (Long-horned Beetles): *Tetraopes tetraphthalmus* (Red Milkweed Beetle) feeds on roots, leaves, and flowers of Common Milkweed.

Cerambycidae (Long-horned Beetles): *Megacyllene robiniae* (Locust Borer) feeds on Black Locust wood as larvae. Adults feed on nectar and pollen, often of goldenrods.

Coccinellidae (Lady Beetles): *Adalia bipunctata* (Two-spotted Lady Beetle) consumes aphids and adelgids.

Coccinellidae (Lady Beetles): *Chilocornus stigma* (Twice-stabbed Lady Beetle) consumes aphids.

Coccinellidae (Lady Beetles): *Coccinella novemnotata* (Nine-spotted Lady Beetle) consumes aphids.

Coccinellidae (Lady Beetles): *Coleomegilla maculata* (Spotted Lady Beetle) consumes aphids and pollen.

Coccinellidae (Lady Beetles): *Harmonia axyridis* (Asian Multicolored Lady Beetle) consumes aphids. The U.S. Federal Government introduced this species into the U.S., and this species has become abundant and pestiferous to Humans, sometimes even disrupting human weddings with swarms.

Chrysomelidae (Leaf Beetles): *Chrysochus auratus* (Dogbane Beetle) consumes roots of Indian-hemp as larvae.

Chrysomelidae (Leaf Beetles): *Diabrotica undecimpunctata* (Spotted Cucumber Beetle) consumes leaves and flowers. It spreads a virus that harms some members of the Cucumber Family, including cultivated Cucumbers.

Chrysomelidae (Leaf Beetles): *Odontota dorsalis* (Locust Leafminer) consumes leaves of Black Locust and other plants as larvae and adults.

Chrysomelidae (Leaf Beetles): *Plagidera versicolora* (Laicharting, 1781), Imported Willow Leaf Beetle is native to the Holarctic Region, Pakistan, and Taiwan. Science discovered it in the U.S. in 1915. Adults and larvae feed on *Populus* (Poplars) and *Salix* (Willows). The adults can be common and cause considerable leaf and leaf-bud damage to host trees in the WDC Area.

Curculionidae (Weevils) consume fruit and seeds. Almost every angiosperm has a species of weevil parasite.

Dermeestidae (Carpet and Skin Beetles): feed on dry carrion, pollen, and stored products, depending on the species. Some species enter arthropod collections and can devastate valuable specimens. One specimen is a “dermestid beetle.”

Elateridae (Click Beetles) feed on arthropods; fungi; and plant leaves, roots, seeds, stems, and tubers, depending on the species. One specimen is a “click beetle.”

Lampyridae (Fireflies, Lightningbugs) are beetles that feed on earthworms, mollusks, and other arthropods as larvae. Some adults feed on other species of fireflies. Many firefly species do not have lights.

Lycidae (Lycid Beetles = Net-winged Beetles) feed on fungi as larvae and on honeydew at aphid colonies as adults. One specimen is a “net-winged beetle” in this course.

Scarabaeidae (Scarab Beetles): *Cotinis nitida* (Green June Beetle) as larvae consume roots of forest and other plants. This beetle is the host of a pollinating scoliid wasp.

Scarabaeidae (Scarab Beetles): *Popillia japonica* (Japanese Beetle) is an alien, invasive species whose larvae eat roots of herbaceous plants, including grasses. Adults consume leaves and flowers of many plants including native plants (Virginia Creeper and grape and rose species) and the alien invasive forest pest the Porcelainberry, but not enough to control this noxious vine. This beetle species is a garden pest in the WDC Area.

Scarabaeidae (Scarab Beetles): *Anomala orientalis* (Waterhouse) (Oriental Beetle) is an alien species that consumes plant roots as larvae and flowers as adults. The adults are brown with dark spots or all black. This species is a garden pest in the WDC Area.

Silphidae (Carrion Beetles): *Oiceoptoma noveboracense* (carrion beetle) feeds on carrion as larvae and adults. This species is common in forests. One specimen is a “carrion beetle.”

Order Coleoptera (Beetles): Tenebrionidae (Darkling Beetles): 52 species know from Great Falls Park and TRP, VA (Mr. Warren Steiner, pers comm., 2009).

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Order Diptera (Flies)

Dr. F. Christian Thompson led the Diptera Group at the 1996 Bioblitz at Kenilworth Gardens (WDC, 31 May – 1 June), and the Group collected 183 species.

Since 1916, researchers surveyed flies of the WDCA.

Dr. Wayne N. Mathis and his team collected 190 fly species in 34 families during the 2006 Bioblitz (Evans 2006, 52).

Order Diptera: Ephydriidae (Shore Flies). Plummers Island, MD, 29 spp.: Turkey Run Park and Great Falls Park, VA, 73 spp. (Wayne Mathis, talk on 2 April 2009).

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Order Diptera: Syrphidae (Flower Flies). WDCA, 232 spp. (Dr. F. Christian Thompson, talk, 2 April 2009).

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Order Ephemeroptera (Mayflies), Neuroptera (Neuropterans), Plecoptera (Stoneflies), Trichoptera (Caddisflies). Oliver S. Flint has been surveying Ephemeroptera, Neuroptera, Plecoptera, and Trichoptera in the WDCA over the last few years.

Dr. Flint obtained 6 ephemeropteran species, 4 plecopteran species, 4 neuropteran species, and 42 trichopteran species during the 2006 Bioblitz (Evan 2008, 40).

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Order Heteroptera (True Bugs)

Dr. Thomas J. Henry collected 55 heteropteran species in 14 families during the 2006 Bioblitz (Evans 2008, 43).

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Order Lepidoptera (Butterflies and Moths)

Researchers have been surveying lepidopterans in the WDCA since the early 1900s.

Dr. John W. Brown and his team found 185 species in 28 families during the 2006 Bioblitz (Evans 2008, 57).

Order Lepidoptera: Butterflies (several families): WDCA, 104 species (Mr. Dick Smith’s records online).

Hesperiidae (Skippers): *Epargyreus clarus* (Cramer), 1775 (Silver-spotted Skipper). Native to much of the contiguous U.S., extreme Southern Ontario ("the Banana Belt"), Canada, Northern Mexico. In forests and other habitats. Larvae feed on some members of the Bean Family (beggarticks, Black Locust, Hog-peanut, Kudzu-vine). Adults feed on nectar of Blazingstars, Buttonbush, Common Dogbane, Common Milkweed, Everlasting-pea, Japanese Honeysuckle, Joe-pye-weeds, privets, Purple Vetch, Red Clover, Selfheal, Springcress, Swamp Milkweed, thistles (including Bull Thistle and Canada Thistle), and Viper's-bugloss.

Hesperiidae (Skippers): *Polites coras* (Cramer), 1775 (Peck's Skipper). Native to Canada south through Georgia and west through Washington. Larvae feed on grasses. Adults feed on nectar of Blue Vervain, Common Dogbane, Common Milkweed, Frogfruit, New Jersey-tea, New York Ironweed, Purple Vetch, Red Clover, Selfheal, and thistles (including Bull Thistle).

Lycenidae (Gossamer-winged Butterflies): *Celastrina neglecta* (Summer Azure). Native to Canada south through Texas and Florida. Researchers recently distinguished this species from the Spring Azure, and the literature is confused regarding larval host plants and other plant records. Glassberg (1999) says that larvae feed on "a wide variety of plants from many different families." In Bethesda, Maryland, I have seen Summer Azures sipping nectar from Buttonbush, White Clover, and Wingstem, which they might pollinate. I've seen mother Summer Azures lay eggs on Wingstem and larvae consuming this plant. The Eastern-tailed Blue, Spring Azure, and Summer Azure are the main "little metallic blue butterflies" that one sees in the Washington, D.C., Area.

Lycenidae (Gossamer-winged Butterflies): *Calycopis cecrops* (Fabricius), 1793 (Red-banded Hairstreak). Long Island south along the Atlantic Coastal Plain through Florida and west through Coastal Texas, and north along the Mississippi River Drainage through Ohio. Vagrants occur in Michigan and Northern Illinois. Larvae consume Dwarf Sumac, some oak species, Staghorn Sumac, and Waxmyrtle. Adults consume nectar from many plant species including Common Dogbane, Common Milkweed, New Jerseytea, Sweet Pepperbush, Tickseed Sunflower, Wild Black Cherry, and Yarrow,

Lycenidae (Gossamer-winged Butterflies): *Everes comyntas* (Godart), 1824 (Eastern-tailed Blue). Native to much of Eastern U.S., SE Arizona south through Costa Rica. Along forest edges and in other habitats. Larvae feed on many species of the Pea Family (Alfalfa, beggar's-ticks, bushclovers, Red Clover, vetches, White Clover, Yellow Sweetclover). Adults feed on nectar of many species including cinquefoils, wild strawberries, Shepard's-needle, Springrocket, White Clover, and wild asters. This butterfly has a short tongue and it feeds on nectar from open flowers and those with short corollas. This butterfly species, unlike many other members of its family, can be common in urban (and suburban) areas of Eastern U.S., where there are lots of clovers in lawns and other food plants. The Federally endangered Karner Blue is in this family. The Xerces Blue went extinct in the U.S. (California). The Xerces Society, named after this butterfly, promotes invertebrate conservation.

Lycenidae (Gossamer-winged Butterflies): *Strymon melinus* (Hübner), 1818 (Gray Hairstreak). Native to Nova Scotia west through central British Columbia and south through the entire United States and seasonally dry lowlands of Mexico and Central America, but not in the West Indies. Larvae feed on plants in many plant families including Fabaceae, the Bean Family (Beans, Bushclover, Clovers, Ticktrefoils, and Vetches) and Malvaceae, Mallow Family (mallow and Cottons). Adults consume nectar from many plant species including Common Dogbane, Goldenrods, Milkweeds, Mints, Ticktrefoils, White Sweetclover, and Wintercress.

Nymphalidae (Brush-footed Butterflies): *Danaus plexippus* (Linnaeus), 1758 (Monarch). Native to Southern Canada south through South America. An alien species in Australia, Canary Islands, Hawaii, India, New Zealand, etc. Along forest edges and in other habitats. Larvae feed on many species of milkweeds. Adults feed on nectar of blazingstars, goldenrods, ironweeds, joy-pye-weeds, milkweeds (including Bloodflower, Butterflyweed, and Common Milkweed), Red Clover, sunflowers, and thistles (including Bull Thistle). Opler and Krizek (1984) report that Monarchs commonly pollinate milkweeds, being one of the few butterfly species that pollen their larval host plants. This butterfly which is black, orange, and white, is familiar to many people, but some people mix it up with the Tiger Swallowtail which is black, blue, red-orange, and yellow. The population of Monarchs that migrates from the U.S. to Mexico in the fall is threatened due to forest destruction in Mexico where the Monarchs overwinter as adults.

Nymphalidae (Brush-footed Butterflies): *Euptoieta claudia* (Cramer), 1775 (Variegated Fritillary). Native to much of the U.S. Larvae consume leaves of passionflowers and violets. Adults feed on many plant species including Butterflyweed, Common Dogbane, Common Milkweed, Peppermint, Red Clover, and Swamp Milkweed.

Nymphalidae (Brush-footed Butterflies): *Limnitis arthemis astyanax* (Fabricius), 1775 (Red-spotted Purple = *Limnitis arthemis arthemis* (Drury), 1773, the White Admiral). Native to much of the contiguous U.S., Southern Canada, Northern Mexico. Larvae feed American Basswood, American Hornbeam, on some members of the Beech Family (oaks including Black Oak and Willow Oak), Deerberry, some members of the Rose Family (cherries including Wild Black Cherry, hawthorns, shadbushes), some members of the Willow Family (aspens including Trembling Aspen, poplars, willows), and Yellow Birch. Adults consume juices from carrion, dung, and rotting fruit (such as Domestic Apples, Domestic Pears) and sap from tree sap flows. Adults do not visit flowers for nectar.

Nymphalidae (Brush-footed Butterflies): *Phyciodes tharos* (Drury), 1773 (Pearl Crescent). Native to Southern Canada south through Mexico, not in the Pacific Northwest and Northern California. Along forest edges and in other habitats. Larvae feed on some species of wild asters. Adults feed on nectar of many plant species including Butterflyweed, Peppermint, Swamp Milkweed, Black-eyed-susan, Shepard's-needle, some aster species, Tickseed Sunflower, White Clover, and Wintercress. Adults of this species are common in the WDC Area.

Nymphalidae (Brush-footed Butterflies): *Speyeria cybele* (Fabricius), 1775 (Great-spangled Fritillary). Native from Southern Canada from the Pacific to the Atlantic Oceans south in Eastern U.S., to Arkansas through Georgia. Larvae feed on violet leaves and stems. Adults feed on nectar from Alfalfa, bergamonts, Common Dogbane, ironweeds, joe-pye-weeds, milkweeds, Mountain-laurel, Purple Coneflower, Red Clover, verbenas, and vetches. An Alfalfa field with its violet though white and yellow flowers visited by many Great-spangled Fritillaries is a lovely site.



Papilionidae (Swallowtails): *Battus philenor* (Linnaeus), 1771 (Pipevine Swallowtail). Native to much of Eastern U.S., south along the Gulf Coast through Arizona and California, south through Southern Mexico. In forests and other habitats. Larvae feed on pipevines of many species. Adults feed on nectar many plant species including azaleas, beebalms, Bull Thistle, Butterflybush, Common Milkweed, Dame's-rocket, lilacs, Madagascar Periwinkle, pentas, Petunia, phloxes, teasels, and Viper's-bugloss. Professor Weiss of GU found that this butterfly species readily learns the relationship between floral color and nectar availability. After I planted pipevines in my garden, Pipevine Swallowtails which are rare in my area, eventually found the plants and laid eggs on them.

Papilionidae (Swallowtails): *Eurytides marcellus* (Cramer), 1777 (Zebra Swallowtail). Native to much of the southern 2/3 of Eastern U.S. In forests and other habitats. Larvae feed on pawpaw species. In the US, adults feed on nectar of blackberries, blueberries, Common Dogbane, Eastern Redbud, gooseberries, lilacs, verbenas, and Viper's-bugloss. Adults feed on nectar of Bull Thistle, Butterflybush, Common Dogbane, and Common Milkweed in Bethesda, Maryland in my garden.

Papilionidae (Swallowtails): *Papilio cresphontes* Cramer, 1777 (Giant Swallowtail). Native to much of Eastern U.S., south along the Gulf Coast through Arizona and California, south through Northern South America, part of Great Plains, West Indies. This is the largest butterfly in the WDC Area where it is rare. In forests and other habitats. Larvae feed on members of the Citrus Family, including Common Rue, Hercules-club, Prickly-ash, Torchwood, Wafer-ash, and Wild-lime. The larva of this butterfly is the Orange-dog, and larvae are sometimes common enough to be important pests on citrus trees — Grapefruit, Lemon, Lime, Orange, Tangerine, etc. In 6 seasons of searching, I never found an Orange Dog abundance in Tampa, Florida, when I was young, fast, and had 20-20 vision.

Papilionidae (Swallowtails): *Papilio polyxenes asterius* (Stoll), 1782 (Black Swallowtail). Native to much of Eastern U.S., south along the Gulf Coast through Arizona and California, Great Plains, south through the mountains of Peru. Along forest edges and in other habitats. Larvae feed on some members of the Citrus Family (including Common Rue and Texas Turpentine-broom), and some members of the Parsley Family (including Caraway, Carrots, Clery, Dill, Fennel, Honewort, Parsley, and Queen-Ann's-lace). Honewort is a forest plant. In some past years, I've planted Dill and Parsley, and usually had some Black Swallowtail larvae on these plants. Adults feed on nectar of many plant species including Black-eyed-susan, Bull Thistle, Canada Thistle, milkweeds, and Red Clover.

Papilionidae (Swallowtails): *Papilio troilus* Linnaeus, 1758 (Spicebush Swallowtail). Native to much of Eastern U.S., Southern Great Plains. In forests and other habitats. Larvae feed on forest trees — Redbay, Sassafras, Spicebush. Adults feed on nectar of Bull Thistles, Butterflybush, Buttonbush, and Buzylizies in Bethesda, Maryland. Adults may pollinate some flowers they visit.

Papilionidae (Swallowtails): *Pterourus glaucus* Linnaeus, 1758 (Eastern Tiger Swallowtail). Native to much of Eastern U.S., much of the Great Plains, extreme southern Ontario, Canada. In forests and other habitats. Larvae feed on Sweetbay Magnolia, Tuliptree, Wafer-ash, White Ash, and Wild Black Cherry. Adults feed on nectar of many plants including *Abelia grandiflora*, Butterflybush, Buttonbush, ironweeds, Japanese Honeysuckle, Joe-pye-weed, lilacs, milkweeds (including Common Milkweed and Swamp Milkweed), and thistles (including Bull Thistle).

Pieridae (Pierids): *Colias eurytheme* Boisduval, 1852 (Alfalfa Butterfly = Orange Sulphur). Native to much of the contiguous U.S. and Northern Mexico. Along forest edges and in other habitats. Larvae feed on Alfalfa and White Sweet Clover (alien plants) and other members of the Pea Family.

Pieridae (Pierids): *Colias philodice* Godart, 1819 (Clouded Sulphur). Native to much of the contiguous U.S. and Northern Mexico. Along forest edges and in other habitats. Larvae feed on Alfalfa, Red Clover, and White Clover (alien plants) and other members of the Pea Family.

Pieridae (Pierids): *Pieris rapae* (Linnaeus), 1758 (Imported Cabbage Butterfly). Native to Eurasia; alien in most of the contiguous U.S., Southern Canada, Northcentral Mexico, Australia. Along forest edges and in other habitats. Larvae feed on many species in the Mustard Family (Black Mustard, Broccoli, Brussels-sprouts, Cabbage, Collards Kale, Radish, etc.) and members of the Caper Family (Spiderflower). Adults sip nectar from 100s of plant species including beebalms, Black Mustard, Broccoli, Brussels-sprouts, Cabbage, Common Dogbane, Common Milkweed, Lavender, Oregano, Peppermint, Radish, Red Clover, Selfheal, Spearmint, Springrocket, wild asters).

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## References

Barrows, Edward M. 2006. Butterfly diversity in a suburban yard in Eastern United States compared to regional diversity. *News of the Lepidopterist's Society* 48: 84–87, 90.

ABSTRACT. Butterfly habitat in farmlands and natural areas is shrinking as urban sprawl is expanding in many parts of the world. In view of that land-use change, this study records the butterfly species richness and abundance in a suburban-yard arthropod preserve in eastern United States. Further this study compares the preserve's butterfly diversity with that of the preserve's metropolitan region of about 4,000,000 km<sup>2</sup>, the Washington, D.C., Area (WDCA), which comprises urban, suburban, farmland, and natural areas. Forty-four (13 uncommon and 31 common WDCA species) of the 104 known WDCA butterfly species appeared in the preserve during 12 flight seasons. Twenty-five (57%) of the 44 yard species had the same abundances (either common or uncommon) as those from the entire WDCA. The preserve had significantly more WDCA common species than uncommon ones. At least eight species had larvae in the preserve, including the WDCA-uncommon *Battus philenor* Linnaeus. (Since 2006, I found two more butterfly species in my yard: Buckeye, Giant Swallowtail.)

Cech, R. and G. Tudor. 2005. *Butterflies of the East Coast*. Princeton University Press, Princeton, NJ. 345 pp.

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Opler, P. A. and G. O. Krizek. 1984. *Butterflies East of the Great Plains*. The Johns Hopkins University Press. 294 pp.

Opler, Paul A., Harry Pavulaan, Ray E. Stanford, and Michael Pogue, coordinators. 2006. *Butterflies and Moths of North America*. Bozeman, MT: Mountain Prairie Information Node. <http://www.butterfliesandmoths.org/> (1 December 2007) (life-history information, maps, photographs, etc.)

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#### Order Hymenoptera (Ants, Bees, Wasps)

Dr. Karl V. Krombein was the primary surveyor of hymenopterans in the WDCA in the mid-1900s.

Order Hymenoptera (Bees, several families): Mr. Sam Droege and his team found 48 bee species in 5 families during the 2006 Bioblitz (Evans 2008, 57).

Order Hymenoptera: Formicidae (Ants): Dr. Daniel S. Kjar found 17 ant species during the 2006 Bioblitz (Evans 2008, 57).

Order Hymenoptera: Wasps (many families): Mr. Sam Droege and his team found 29 wasp morphospecies during the 2006 Bioblitz (Evans 2008, 57).

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#### Order Mecoptera (Scorpion Flies and Kin)

About 10 mecopteran species occur in the WDCA.

Mr. Joshua Jones and his team found only one mecopteran species (*Bittacus strigosus* Hagen) during the 2006 BioBlitz which occurred during a poor time for collecting mecopterans (Evans 2006, 43).

*Panorpa helena* Byers from Turkey Run Park is at <http://biodiversity.georgetown.edu/searchfiles/infosearch.cfm?view=all&IDNumber=2851>. George Byers (my former professor) named this species after his wife.

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Order Odonata (Odonates, several families). WDCA, — about 100 spp. in the WDCA (Richard L. Orr in Evans, 2008).

Dr. Richard Orr and his team found 46 odonate species in 9 families during the 2006 Bioblitz. He has extensively survey WDCA odonates over many years.

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Subphylum Crustacea (Zachary Loughman and Janet W. Reid in Evans 2008, 30).

Order Amphipoda: Crangonyctidae (Crangonytid Amphipods): 3 species.

Order Copepoda: 20 species.

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Order Decapoda (Crabs and kin): Cambaridae (Crayfish): 4 species known from the Potomac Gorge Area so far. North American crayfish species richness peaks in the Southern Appalachians. *Procambarus clarkii* (Girard) (Louisiana Red Crayfish) is an aquaculture animal, an important invasive species in the US, and likely resides in Great Falls Park, VA. For other crayfish species may also occur in the Potomac Gorge Area.

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Order Decapoda (Crabs and kin): Cambaridae (Crayfish): *Cambarus* (*Cambarus*) *bartonii bartonii* (Fabricius) (Appalachian Brook Crayfish).

Order Decapoda (Crabs and kin): Cambaridae (Crayfish): *Cambarus* (*Lacunicambarus*) *diogenes* (Girard) (Devil Crayfish). This is a burrowing crayfish that occurs in lentic habitats, lotic habitats, and moist lawns. Burrows are up to 0.7 meters deep. Each has an enlarged resting area at its deep end. Many burrows have ancillary tunnels up to 0.7 meters long, chimneys, or both.

Order Decapoda (Crabs and kin): Cambaridae (Crayfish): *Orconectes* (*Faxonius*) *limosus* (Rafinesque) Spiny-cheeked Crayfish. Native to Midwest U.S. *Orconectes virilis* appears to be causing local extinction of the native *Orconectes* (*Faxonius*) *limosus*.

Order Decapoda (Crabs and kin): Cambaridae (Crayfish): *Orconectes virilis* (Hagen), an aggressive, invasive species.

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Order Isopoda: Asellidae (Asellid Isopods): 2 species.

Order Isopoda: Trichoniscidae (Trichoniscid Isopods): 1 species.

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#### Table 4C. Eucarya: Animalia: Chordata

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##### Phylum Chordata, Chordates

Lists: PI (Manville and Wetmore 1968, vertebrates)

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##### Class Pisces (Fishes)

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List: DMWP (Johnston 2000): 62 spp.

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##### Class Amphibia (Amphibians)

Lists: DMWP (Johnston 2000): 13 spp., PI (Brady 1937); Potomac Gorge (Evans 2008). A total of 12 frog and toad and 13 salamander species are known from the Potomac Gorge (Evans 2008, 67).

~~~~~  
Bufonidae (Toad Family): *Bufo americanus* (*Anaxyrus americanus* (Holbrook), new name; American Toad). Paratoid glands do not touch cranial bulge. DMWP.

~~~~~  
Bufonidae (Toad Family): *Bufo fowleri* (Fowler's Toad).

~~~~~  
Class Reptilia (Reptiles)

Lists: DMWP (Johnston 2000): 20 spp.; PI (Brady 1937); Potomac Gorge (Evans 2008). A total of 5 lizard and 19 snake species are known from the Potomac Gorge (Evans 2008, 67).

Mr. Jason D. Gibson and Mr. Paul Sattler found 16 reptilian species during the 2006 Bioblitz (Evans 2008, 64).

~~~~~  
Colubridae (Colubrid Snake Family): *Thamnophis sirtalis* (Common Garter Snake). TRP.

Emydidae (Pond and Box Turtle Family): *Terrapene carolina* (Eastern Box Turtle). DMWP.

Iguanidae (Iguana Family): *Sceloporus undulatus* (Eastern Fence Lizard). BI.

Scincidae (Skink Family): *Eumeces fasciatus* (Five-lined Skink). DMWP.

Scincidae (Skink Family): *Eumeces laticeps* (Broad-headed Skink). TRP.

Tegidae (Tegus and Whiptail Family): *Cnemidophorus sexlineatus* (Six-lined Racerunner).

Viperidae: *Agkistrodon contortrix* (Palisot de Beauvois) (Copperhead). The Reptile Team found 5 Copperheads during the 2006 Bioblitz.

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Class Aves (Birds)

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Accipitridae (Hawk Family): *Haliaeetus leucocephalus* (Bald Eagle). U.S. National Bird. DMWP.

Accipitridae (Hawk Family): *Cathartes aura* (Turkey Vulture). Reddish, featherless head. DMWP.

Accipitridae (Hawk Family): *Coragyps atratus* (Black Vulture). Grayish, feathered head. DMWP,

Accipitridae (Hawk Family): *Pandion haliaetus* (Osprey). DMWP,

Anatidae (Duck Family): *Branta canadensis* (Canada Goose). 3.33 feet long, 6-ft wingspan. DMWP, TRP.

Anatidae (Duck Family): *Anas platyrhynchos* (Mallard Duck). 24 inches long. DMWP, TRP.

Ardeidae (Heron Family): *Ardea herodias* (Great Blue Heron). 4 feet long, 6-ft wingspan. BI, DMWP, TRP.

Columbidae (Pigeon Family): *Zenaidura macroura* (Linnaeus, 1758) (Mourning Dove). DMWP, TRP (1 pair on 2009 04 05).

Phalacrocoracidae (Cormorant Family): Double-crested Cormorant (*Phalacrocorax auritus*). TRP (2009)

Phasianidae (Pheasant Family): *Meleagris gallopavo* (Wild Turkey). Is this bird extinct in TRP?

Picidae (Woodpecker Family): *Dryocopus pileatus* (Pileated Woodpecker). DMWP, TRP.

Strigidae (Owl Family): *Strix varia* (Barred Owl). DMWP, TRP (2007).

Trochilidae (Hummingbird Family): *Archilochus colubris* (Linnaeus, 1758) (Ruby-throated Hummingbird). DMWP. This species pollinates plants.

Turdidae (Thrush Family): *Turdus migratorius* (American Robin). DMWP, TRP (often forages on paths).

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Lists: DMWP (Johnston 2000): circa 300 spp.; PI (Fisher 1935).

~~~~~  
Class Mammalia (Mammals)

~~~~~  
Canidae (Dog Family): *Canis latrans* (Coyote).

Canidae (Dog Family): *Vulpes vulpes* (Red Fox). DMWP.

Canidae (Dog Family): *Urocyon cinereoargenteus* (Common Gray Fox).

Castoridae (Beaver Family): *Castor canadensis* (American Beaver). TRP.

Cervidae (Deer Family): *Odocoileus virginianus* (White-tailed Deer). DMWP.

Crecitidae (Mouse Family): *Peromyscus leucopus* (White-footed Mouse). This Mouse is common in Eastern US forests. DMWP.

Leporidae (Rabbit Family): *Sylvilagus floridanus* (Eastern Cottontail). DMWP, TRP.

Mephitidae (Skunk Family): *Mephitis mephitis* (Striped Skunk). DMWP.

Procyonidae (Raccoon Family): *Procyon lotor* (Common Raccoon). DMWP, TRP (2007).

Scuridae (Squirrel Family): *Sciurus carolinensis* (Eastern Gray Squirrel). DMWP, TRP.

~~~~~  
Lists: DMWP (Johnston 2000): 24 spp.; PI (Goldman and Jackson 1939)  
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~~~~~  
Part 4. Eucarya: Fungi  
~~~~~

Fungus List: PI (Stevenson and Ermold 1936).

Lichen List: ____

Mr. Lance T. Biechele and his team surveyed slime molds and fungi during the 2006 Bioblitz (Evans 2008, 23). This is the first known such survey for the Potomac Gorge. The team found 5 slime-mold species and 62 fungus species (55 identified to species, 6 unknown mushroom species, and 3 unidentified rust species). The Bioblitz occurred in mid-June which is a suboptimal time to survey these organisms. There are perhaps over 180 fungus species in the Gorge Area.

~~~~~  
Fungus classification keeps changing, and my fungus books give different, confusing renditions of the classification. I gave up on the classifications in my books for now, so my list below is based on groups delineated by the Tree of Life (<http://www.tolweb.org/Fungi/2377>, 15 March 2008). To see the phylogram, please go to the site. There are many unresolved branches in the basic fungus phylogram.

~~~~~  
Kingdom Fungi (summary of branches, <http://www.tolweb.org/Fungi/2377>, 15 March 2008)

Main Branch Dikarya (Mushrooms, Rusts, Smuts, etc.)

Branch Basidiomycota

Branch Ascomycota

Branch Glomeromycota

Branch Zygomycota

Branch *Olpidium brassicae*

Branch Blastocladiomycota (Blastocladiales)

Branch Chytridiomycota (zoosporic fungi)

Branch Neocallimastigomycota (Neocallimastigales)

Branch Microsporidia

Branch *Rozella* spp.
~~~~~

2-pronged Branch Dikarya (Mushrooms, Rusts, Smuts, etc.) with Basidiomycota and Ascomycota.

~~~~~  
Branch Basidiomycota
~~~~~

Agaricaceae: *Agaricus campestris* (Meadow Mushroom). Sporocarps are large white caps with light brown gills. This species is the main mushroom of commerce in the US and perhaps elsewhere. There are two other *Agaricus* species that are very similar to *A. campestris*.

Amanitaceae: Amanitas (Death-angels). Most species are highly poisonous to Humans.

(We usually do not see any of these highly toxic mushrooms.)

Coprinaceae: Inky Cap Mushrooms. Sporocarps are small conical through nearly flat caps on stipes; caps become blackish and gooey.

Coprinaceae: *Coprinus comatus* (Shaggy-mane, Shaggy Ink-cap). Sporocarps are large caps that are white and turn gray. This species is sometimes in lawns at GU.

Polyporaceae: *Trametes conchifer* (Potomac Gorge Bioblitz 2006) (Potomac Gorge Bioblitz 2006).

Coriolaceae: *Trametes* sp., possibly *gibbosa* (Gibbous Polypore). The sporocarp is a white shelf fungus.

Coriolaceae: *Trametes versicolor* (Turkey-tail Fungus, Many-zoned Polypore). Sporocarps are zoned bract-fungus bodies. This is an abundant species in the WDCA. (Potomac Gorge Bioblitz 2006).

Polyporaceae: *Trametes hirsuta* (Hairy Polypore). Sporocarps are whitish shelf-fungus bodies.

Ganodermataceae: *Ganoderma applanatum* (Artist's-conk, Artist's Fungus, Artist's Mushroom Artist's Polypore). This species is common in the WDCA. (Potomac Gorge Bioblitz 2006).

Ganodermataceae: *Ganoderma lucidum* (Ling Chih). (Potomac Gorge Bioblitz 2006).

Hericiaceae: *Hericium erinaceus* (Bull.) Persoon (Hedgehog Fungus).

Hymenochaetaceae: *Phellinus rimosus*, Black Locust Shelf Fungus (brownish shelf fungus)

Polyporaceae: *Daedaleopsis confragosa* (Thin-maze Flat Polypore, photo).

Polyporaceae: *Laetiporus sulphureus* (Chicken Polypore, Chicken-of-the-woods). Some people eat this fungus. (Potomac Gorge Bioblitz 2006)

Polyporaceae: *Pleurotus ostreatus* (Common Oyster Mushroom). Some people eat this fungus.

Polyporaceae: *Polyporus radicans* (Potomac Gorge Bioblitz 2006) (Potomac Gorge Bioblitz 2006).

Polyporaceae: *Pycnoporus cinnabarinus* (Cinnabar Polypore). Sporocarps are bright, scarlet-red shelf-fungus bodies.

Polyporaceae: *Oligoporus caesius* (Schrad.: Fr.) Gilbn. & Ryv. (Blue Cheese Polypore). Sporocarps are whitish shelf-fungus bodies.

Pucciniaceae: *Gymnosporangium juniperi-virginianae* Schw. (Apple Rust = Cedar-apple, Cedar-apple Fungus, Cedar-apple Rust) parasitizes *Juniperus virginiana* (Eastern Redcedar) and *Malus* spp. (species of apples). This fungus makes, fleshy, spheroidal bodies about 2 cm in diameter on Eastern Redcedar limbs. In the spring after rains, stunning orange, fingerlike bodies grow out of the spheroids. This fungus makes spots on apple leaves as well. This is one of the thrilling fungi for sure.

[http://www.mushroomexpert.com/gymnosporangium\\_juniperi-virginianae.html](http://www.mushroomexpert.com/gymnosporangium_juniperi-virginianae.html) (March 15, 2009)

Russulaceae: Russulas. Sporocarps are large fleshy caps on stipes.

Stereaceae: *Stereum purpureum* (Hairy Stereum). Sporocarps are zoned shelf-fungus bodies with downy upper surfaces. This species resembles the Turkey-tail Fungus.

Tricholomataceae: *Armillaria mellea* (Honey Fungus). Sporocarps are light brown caps which occur in groups on trees and in soil. This parasitic species harms trees.

~~~~~  
Branch Ascomycota
~~~~~

Auriculariaceae: *Auricularia auricula-judae*, Wood-ear-jelly (brown, gelatinous, downward facing cups on angiospermous trees)

Geastraceae and Sclerodermataceae (Earth-stars).

Leotiaceae: *Asocoryne cylichnium* (Purple Jelly-drop-cup). Purplish-brown, gelatinous cups on bark and exposed xylem of angiospermous trees.

Lycoperdaceae: *Lycoperdon perlatum* (Common Puffball). Sporocarps have very warty outer skins. (Potomac Gorge Bioblitz 2006)

Lycoperdaceae: *Lycoperdon pyriforme* (Pear-shaped Puffball, Stump Puffball). Sporocarps have smooth outer skins. (Potomac Gorge Bioblitz 2006).

Morchellaceae (Morel Family): *Morchella* spp., Morels. Sporocarps like sponge-on-a-stick. People prize some of the species for eating. Some species are poisonous, beware!

Morchellaceae (Morel Family): *Morchella elata* (Black Morel, photo) (Potomac Gorge Bioblitz 2006).

Morchellaceae (Morel Family): *Morchella semilibera* (Half-free morel, photo) (Potomac Gorge Bioblitz 2006).

Nidulariaceae (Bird's-nest Fungi). There are several species. Sporocarps look like little nests with eggs inside.

Pezizaceae: *Peziza vesiculosa* (Bladder-cup). Sporocarps are light brown, gelatinous cups that grow on mulch and other humic material.

Phallaceae: *Mutinus caninus* (Dog Stinkhorn). The sporocarp of this species looks like a dog's penis, smells like rotting flesh, and attracts flies which spread its spores — a marvel of nature to be sure!

Sarcoscyphaceae: *Sarcoscypha coccinea* (Scarlet Elf-cup, Stalkless Scarletcup). The sporocarp of this species is a scarlet, cup shaped, resembles Orange-peel Fungus which is more irregular in shape than the Scarlet Elf-cup. (Potomac Gorge Bioblitz 2006)

Sarcoscyphaceae: *Sarcoscypha occidentalis* (Stalked Scarletcup) (Potomac Gorge Bioblitz 2006).

Tremellaceae: *Exidia glandulosa* (Witches-butter). The sporocarps are black, jelly-like bodies.

Tremellaceae: *Tremella mesenterica* (Yellow-brain-jelly) Sporocarps are fleshy, soft, flabby lobes which are white through cadmium yellow.

Xylariaceae: *Xylaria polymorpha* (Dead-man's-fingers Asco). Sporocarps are black and fingerlike in shape. There are some other some similar looking species.

~~~~~  
Branch Glomeromycota

~~~~~  
Branch Zygomycota

~~~~~  
Branch *Olpidium brassicae*

~~~~~  
Branch Blastocladiomycota (Blastocladiales)

~~~~~  
Branch Chytridiomycota (zoosporic fungi)

~~~~~  
Branch Neocallimasigomyco (Neocallimastigales)

~~~~~  
Branch Microsporidia

~~~~~  
Branch *Rozella* spp.

~~~~~  
Glossary

mycorrhiza *n., pl.* mycorrhizae A mutualistic association between a plant root and a fungus (Campbell 1996, 723).
cf. symbiosis

Comments: The fungus secretes a growth factor that stimulates the root to grow and branching (Campbell 1996, 584, 723). Depending on the species involved, the fungus either sheaths the root and extends its hyphae among its cortex cells or invades the root cells themselves. The fungus mycelium provides the root with a greatly increased surface area through which it gains minerals, especially phosphate, and water. The fungus is more efficient at absorbing these materials and secretes an acid that increases the solubility of some minerals. The root obtains minerals and water from the fungus, and the fungus obtains photosynthetic products from the plant. The fungus also protects the plant against certain soil pathogens. Over 95% of vascular plants may have mycorrhizae if they contact the appropriate fungus species. Plants without their mycorrhizae can be malnourished and show decreased growth compared to conspecific plants with their mycorrhizae. Ascomycota, Basidiomycota, and Zygomycota form mycorrhizae. Half of all species of mushroom-forming Basidiomycetes live as mycorrhizae with Birches, Oaks, and Pines.

Mycorrhizal genera include *Albatrellus*, *Amanita*, *Boletus*, *Boletopsis*, *Cantharellus*, *Catathelasma*, *Clitopilus*, *Chroogomphus*, *Clavariadelphus*, *Cortinarius*, *Cystoderma*, *Elaphomyces*, *Entoloma*, *Gautieria*, *Gomphidius*, *Gyroporus*, *Hebeloma*, *Hydnum*, *Hygrophorus*, *Hydnangium*, *Inocybe*, *Lactarius*, *Leucocortinarius*, *Limacella*, *Leccinum*, *Melanogaster*, *Myxocybe*, *Paxillus*, *Phylloporus*, *Pisolithus*, *Porphyrellus*, *Ramaria*, *Rhizopogon*, *Rizites*, *Russula*, *Sarcosphaera*, *Sepultria*, *Suillus*, *Terfezia*, *Tricholoma*, *Tuber*, and *Tylophilus* (Pacioni 1981).

Some groups of plants may have more than one kind of mycorrhiza (www.mycorrhiza.com). Members of the Ericaceae have two distinct types of mycorrhiza that are unique to this and closely related plant families; some ericads support arbuscular mycorrhizae (AM) as well, *e.g.*, *Arctostaphylos uva-ursi* (the Bearberry). Individual plants of cottonwoods, eucalyptuses, and willows may have both AM and ectomycorrhizae (EM) on their root systems. Seedlings often start off with AM, then change over to EM as the canopy closes and a litter layer begins to accumulate. AM are very common symbioses (Heckman et al. 2001, 1129).

Exudates and hyphae of EM form a major link between above-ground producers and soil food webs, providing carbon for a wide range of bacteria, protozoa, arthropods and microfungi (Pacific Northwest Research Station 1997). Mycorrhizal fungi are also important in above-ground food webs. Ectomycorrhizae, with few exceptions, produce macroscopic sporocarps (mushrooms and truffles) that are important in the diets of animals, especially small mammals. Some rodents such as the California Red-backed Vole (*Clethrionomys californicus*) and Northern Flying Squirrels (*Glaucomys sabrinus*) rely on these sporocarps for over 90% of their food supply and are primary prey for species such as the Northern Spotted Owl.

[Greek *mycos*, fungus + *rhiza*, root]

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Table 6A. Eucarya: Plantae: Nonflowering Plants  
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Phylum Bryophyta (Mosses and Liverworts): 100s of spp. in the WDCA.

Dr. Charles Davis and Mrs. Linda Davis (Davis and Davis 2006), extensively surveyed bryophytes of Great Falls Park. They found 29 families and 48 genera of mosses, 17 families and 20 genera of liverworts, and no hornwort species.

Dorothy Belle Poli and her team found 22 kinds of bryophytes of which they identified 2 liverwort and 15 moss species during June in the 2006 Bioblitz, a poor time to survey bryophytes.

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Lists: PI (Leonard 1935, mosses; Leonard and Pierce 1939; bryophytes, Evans 2008, 25)
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Subclass Sphagnidae (Peat Mosses = Bog Mosses): *Sphagnum* (Conard and Redfearn 1979, 24).

Subclass Andreaeidae (Conard and Redfearn 1979, 27).

Subclass Bryidae: many genera (Conard and Redfearn 1979, 28).

Leucobryaceae: *Leucobryum glaucum* (Hedw.) Angstr. Ex Fr. (White Cushion Moss) (Conard and Redfearn 1979, 86). Potomac Gorge (Evans 2008, 26).

Polytrichaceae: *Polytrichum* (Tree Mosses) ((Conard and Redfearn 1979, 227).

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Phylum Lycophyta
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Lycopodiaceae (Clubmoss Family): *Lycopodium* (Clubmosses) (10 spp. in MD, BB 1984, 1).

Selaginellaceae (Spikemoss Family): *Selaginella* (Spikemosses) (2 spp. in MD, BB 1984, 7).

Isoetaceae (Quillwort Family): *Isoetes* (Quillworts) (3 spp. in MD, BB 1984, 7).

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Lists: BWA (Shetler and Orli 2000), DMWP (Xu 1991, Haug 1993), GFV (Steury et al. 2008), PI (Killip and Blake, 1935, 1953; Shetler et al. 2006).
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Phylum Sphenophyta
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Equisetaceae (Horsetail Family): *Equisetum* (4 spp. in MD, BB 1984, 1).

Equisetaceae (Horsetail Family): *Equisetum arvense* L. (Common Horsetail)

Equisetaceae (Horsetail Family): *Equisetum fluviatile* L. (Water Horsetail)

Equisetaceae (Horsetail Family): *Equisetum hyemale* L. (Scouring-rush)

Equisetaceae (Horsetail Family): *Equisetum sylvaticum* L. (Woodland Horsetail)  
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Lists: BWA (Shetler and Orli 2000), DMWP (Xu 1991, Haug 1993), GFV (Steury et al. 2008), PI (Killip and Blake, 1935, 1953; Shetler et

al. 2006).

Phylum Pterophyta (Ferns). There are 63 fern species in MD.

Ophioglossaceae (Adder's-tongue Family): *Botrychium* (Moonworts, Grape Ferns): 6 spp. in MD (BB 1984, 10).

Ophioglossaceae (Adder's-tongue Family): *Botrychium virginianum* (L.) Sw. (Rattlesnake Fern). Twice compound pinnate leaves, sterile and fertile.

Ophioglossaceae (Adder's-tongue Family): *Ophioglossum vulgatum* L. (Adder's-tongue). Simple leaf. The only *Ophioglossum* in MD.

Osmundaceae (Royal Fern Family): *Osmunda*, 3 spp.. in MD. (BB 1984, 12).

Osmundaceae (Royal Fern Family): *Osmunda cinnamomea* L. (Cinnamon Fern).

Osmundaceae (Royal Fern Family): *Osmunda claytoniana* L. (Interrupted Fern). [after John Clayton]

Osmundaceae (Royal Fern Family): *Osmunda regalis* L. (Royal Fern).

Schizaeaceae (Curly-grass Family): *Lygodium palmatum* (Bernh.) Sw. (Climbing Fern). The only member of this genus in MD (BB 1984, 14).

Polypodiaceae (Fern Family): *Adiantum* (2 spp. in MD), *Asplenium* (8 spp. and at least 2 hybrids), *Athyrium* (4), *Camptosorus* (1), *Cheilanthes* (2), *Cystopteris*(3), *Dennstaedtia* (1), *Dryopteris* (8 sp. and 1 hybrid), *Gymnocarpium* (1), *Matteuccia* (1), *Onoclea* (1), *Pellaea* (2), *Phegopteris* (2), *Phyllitis*(1), *Polypodium* (2), *Polystichum* (1), *Pteridium* (1), *Thelypteris* (3), *Woodsia*(2), *Woodwardsia* (2)

Polypodiaceae (Fern Family): *Adiantum pedatum* L. (Maidenhair Fern). There are two *Adiantum* species in MD (444, 38).

Polypodiaceae (Fern Family): *Matteuccia pensylvanica* Raymond (Ostrich Fern). TRP (a large patch).

Polypodiaceae (Fern Family): *Cystopteris fragilis* (L.) Bernh. (Brittle Fern, Fragile Fern). BI, TRP (common).

Polypodiaceae (Fern Family): *Onoclea sensibilis* L. (Bead Fern, Sensitive Fern). [sensitive, after the fact the early light frosts kill leaves of this fern]

Polypodiaceae (Fern Family): *Polystichum acrostichoides* (Michaux) Schott (Christmas Fern). BI, TRP (common). [Christmas, after the fact that this is an evergreen fern that can be used for Christmas decorations]

Polypodiaceae (Fern Family): *Pteridium aquilinum* (L.) Kuhn (Brake, Braken Fern). There is 1 *Pteridium* species in MD (444, 38).

Marsileaceae (Pepperwort Family): *Marsilea quadrifolia* L. (Pepperwort). Native to Europe. Rarely in natural areas. There is 1 *Marsilea* species in MD (BB 1984, 41).

Salviniaceae (Water Fern Family): *Azolla caroliniana* Willd. (Mosquito Fern). This is the only *Azolla* in MD (BB 1984, 41).

Salviniaceae (Water Fern Family): *Salvinia rotundifolia* Willd. (Salvinia). This is the only *Salvinia* in MD (BB 1984, 41).

Lists: BWA (Shetler and Orli 2000), DMWP (Xu 1991, Haug 1993), GFV (Steury et al. 2008), PI (Killip and Blake, 1935, 1953; Shetler et al. 2006).

Phylum Coniferophyta (Conifers)

Cupressaceae (Cedar Family): *Juniperus virginiana* L. (Eastern Redcedar, Redcedar, Virginia Redcedar). Soft and spiny leaves. Berrylike cones. In River Terrace Forest of BI.

Pinaceae (Pine Family): *Pinus echinata* Mill. (Shortleaf Pine). Potomac Gorge (Evans 2008, 27).

Pinaceae (Pine Family): *Pinus virginiana* Mill. (Jersey Pine, Poverty Pine, Scrub Pine, Virginia Pine). Leaves (needles) are in fascicles of 2. Cones are spiny. In River Terrace Forest of BI, TRP.

Lists: BWA (Shetler and Orli 2000), DMWP (Xu 1991, Haug 1993), GFV (Steury et al. 2008), PI (Killip and Blake, 1935, 1953; Shetler et al. 2006).

Phylum Ginkgophyta (Ginkgos): only one remaining living species.

Ginkgoaceae (Ginkgo Family): *Ginkgo biloba* Linnaeus (Ginkgo). Tree. Native to China. Ginkgos are not invasive in the WDCA. A planted grove of scores of these trees grows at Blandy Research Farm in Boyce, VA. There, seedlings sprout beneath mature trees. Plants are dioecious.


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Table 6B. Eucarya: Plantae: Anthophyta (Flowering Plants): Dicotyledonae.

Lists: BWA (Shetler and Orli 2000), DMWP (Xu 1991, Haug 1993), GFV (Steury et al. 2008), PI (Killip and Blake, 1935, 1953; Shetler et al. 2006; Evans, 2008, page 27, 2006 Potomac Gorge Bioblitz).
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Plant quiz

Which species has blue, pink, or white flowers individuals?

Which species has polymorphism in inflorescence odors?

Which species is evidently often pollinator limited.

Which species tracks the Sun's movement?

Which species flowers last for only about 2 days during warm, sunny weather?

Which species is self-pollinated (geitonogamous)?

Which species recently went extinct in Maryland.

Which species is a bad invasive?

Which species might be killed by an invasive beetle?

Which species has female, male, and hermaphroditic plants?

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Aceraceae (Maple Family). See Sapindaceae (Soapberry Family)
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Anacardaceae (Cashew Family): *Rhus aromatica* Aiton (Fragrant Sumac). Tree. BI.

Anacardaceae (Cashew Family): *Rhus glabra* L. (Smooth Sumac). Tree. May–June. BI, TRP.

Anacardaceae (Cashew Family): *Rhus typhina* L. (Staghorn Sumac). Tree up to 30 feet tall. Green petals. May–June. BI. This plant produces copious nectar and pollen used by many arthropod species including bees (Gold-green Sweat Bee, Western Honey Bee), beetles, butterflies (Summer Azure), and flower flies. Leaves are food of many moth species including the Hickory Horned-devil and the White-tailed Deer. Bark is food of some species of mice and rats and Wood Rats. This is a wonderful plant for a native garden if you have space. This species is clonal, and you will have to control root shoots.

Anacardaceae (Cashew Family): *Toxicodendron radicans* (L.) (Poison-ivy). Woody vine. May. BI, TRP (1000s).

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Annonaceae (Custardapple Family): *Asimina triloba* (Linnaeus) Dunal (Pawpaw). Tree up to 50 feet tall. Dark maroon petals. April. BI, TRP (100s). This plant produces nectar and pollen used by some beetle and dfly species. Floral odor is yeasty and contains acetic acid, ethanol, and ethyl acetate. It produces fruit consumed by some beetle, daddylonglegs, sap-beetle, slug, small-mammal, and snail species, Common Racoons, European Hornet, False Honey Ants, Humans, ichneumon wasps, Red-spotted-purple, and other animals. Younger leaves are food of the Zebra Swallowtail. This is a wonderful plant for a native garden. This species is clonal, and you may have to control its root shoots. Fungi on *Asimina triloba* fruit and leaves are *Mycocentrospora asiminae*, *Rhopaloconidium asiminae* Ellis and Morg., and *Phyllosticta asiminae* Ellis and Kellerm (Crabtree et al. 2012). Seven Species of Sooty Blotch and Flyspeck Fungi occur on *Asimina triloba* fruit in Iowa (Hemnani and O'Malley 2008).
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Apiaceae (Parsley Family): *Apium graveolens* var. *dulcum* (Celery). Forb. Europe. Summer. In someone's sandwich? For people with celery allergy, exposure can cause potentially fatal anaphylactic shock.

Apiaceae (Parsley Family): *Eriogonum bulbosum* (Harbinger-of-spring). Perennial forb. March. Small, white flowers. BI, TRP (1000s).

Apiaceae (Parsley Family): *Chaerophyllum procumbens* (Spreading Chervil). Perennial forb. April. BI.

Apiaceae (Parsley Family): *Daucus carota* L., Queen-Ann's-lace Biennial forb. An alien, aggressive species. Alien from Eurasia, the parent of all cultivated Carrot varieties. Nectar, pollen, or both are food of many bee, beetle, flower-fly, other fly, moth, and wasp species. Nectar feeders include bumble bees and the Western Honey Bee. Seeds are food of cormelaenid bugs. Leaves are food of larvae of the Black Swallowtail and Western Parsley Swallowtail. Roots are food of the Carrot Wireworm (a click beetle). This plant can be common in the early stage of forest succession, but dies out of areas as other more competitive plants take over sites.

Apiaceae (Parsley Family): *Osmorrhiza claytonii* (Sweet-cicely, Wild-anise). Perennial forb. April. There is spreading pubescence on stems. BI, TRP.

Apiaceae (Parsley Family): *Osmorrhiza longistylis* (Sweet-cicely). Perennial forb. April. There is appressed pubescence on stems. BI.

Apiaceae (Parsley Family): *Petroselinum crispum* (Parsley). Europe. Summer. In someone's sandwich?

Apiaceae (Parsley Family): *Zizia aurea* (Golden-alexander). Perennial forb. Yellow petals. April. BI, TRP (10s).

Apocynaceae (Dogbane Family): *Asclepias*, *Amsonia*, *Apocynum*, *Matelea*, *Trachelospermum*, *Vinca*

Apocynaceae (Dogbane Family): *Apocynum cannabinum* (Indian-hemp). Perennial forb. White petals. This plant produces copious nectar consumed by many species including the Buckeye Butterfly, Coral Hairstreak (a butterfly), Edward's Hairstreak (a butterfly), sweat bees, wasps, Western Honey Bee, and the Zebra Swallowtail. The roots of this plant are food of the gorgeous Dogbane Beetle. This is a wonderful plant for a native garden. It is clonal, and gardeners may have to control it.

Apocynaceae (Dogbane Family): *Asclepias syriaca* L. (Common Milkweed). Perennial forb. White through pink, purple, and salmon petals. This plant produces copious nectar, day and night, consumed by many arthropod species including Banded Hairstreak (a butterfly), bumble bees, click beetles, the European Earwig (alien), Grapeleaf-skeletonizer Moth, Giant Carpenter Bee, Giant Resin Bee (alien), Great Spangled Fritillary, Hickory Tussock Moth, Monarch Butterfly, noctuid moths, the Regal Fritillary, Tiger Swallowtail, and Zebra Swallowtail. Roots are food of the Red Milkweed Beetle. Leaves are food of larvae of the Milkweed Beetle, Milkweed Tiger moth, Monarch Butterfly, and Queen Butterfly. Fruits are food of the Large Milkweed Bug. This is a wonderful plant for a native garden. It is clonal, and gardeners may have to control it.

Apocynaceae (Dogbane Family): *Vinca minor* L. (Common Periwinkle). Perennial woody creeping vine. Native to Europe. Alien, invasive. Trailing vine. Blue-violet or white petals. Evergreen leaves. March–April. BI, TRP (1000s)

Aquifoliaceae (Holly Family): *Ilex decidua* Walt. (Possumhaw). Tree. April–May. MD endangered tree. BI.

Aquifoliaceae (Holly Family): *Ilex opaca* Aiton (American Holly). Tree. May. BI, TRP (10s).

Araliaceae (Ginseng Family): *Aralia*, *Hedera*, *Panax*.

Araliaceae (Spikenard Family): *Hedera helix* Linnaeus (English Ivy). Woody vine. Native to Eurasia. A major alien, invasive plant. Green petals. Evergreen leaves. BI, TRP (10s). English Ivy harms forests by covering the ground and choking out native plants and associated biota and covering tree trunks, increasing the likelihood that many trees will fall in storms. Berries are food of native birds that drop its seeds in their feces and thereby spread this problematic plant. The nectar is food of many arthropod species. In April 2009, my Forest Ecology class saw a small flock of American Robins consuming English Ivy berries. New plants may sprout from seeds in droppings of these birds.

Araliaceae (Ginseng Family): *Panax quinquefolius* L. (Ginseng, Sang). Perennial forb. Greenish white petals. June–July. Once abundant; now infrequent in MD because people dug up plants for their medicinal roots and sold them primarily to China (BB 1984, 692).

Araliaceae (Ginseng Family): *Panax trifolius* L. (Dwarf Ginseng). Perennial forb. White petals. April–May. Common in Garrett County and infrequent – rare in Midland and Coastal areas of MD (BB 1984, 692). TRP (100s).

Aristolochaceae (Dutchman-pipe Family): *Asarum canadense* L. (Wild-ginger). Perennial forb. Brownish petals. April–May. BI, TRP (10s).

Asteraceae (Aster Family): Achillea, Ambrosia, Arnica, Artemisia, Arctium, Anaphalis, Antennaria, Anthemis, Aster, Bellis, Bidens, Boltonia, Cacalia, Carduus, Centaurea, Chichorium, Chrysanthemum, Chrysogonum, Chrysopsis, Cirsium, Cnicus, Condrilla, Conza, Coreopsis, Crepis, Eclipta, Elephantopus, erectites, Erigeron, Eupatorium, Filago, Galinsoga, Gnaphalium, Grindelia, Helianthus, Heliopsis, Haplopappus, Helenium, Heterotheca, Hieraceum, Hypochaeris, Inula, Krigia, Kuhnia, Lactuca, Lapsana, Leontodon, Liatris, Madia, Marshallia, Matricaria, Megalodonta, Mikania, Parthenium, Picris, Pluchea, Polymnia, Prenanthes, Pulicaria, Pyrropappus, Onopordum, Rudbeckia, Sclerolepsis, Senecio, Seriocarpus, Silphium, Silybum, Solidago, Sonchus, Tanacetum, Taraxacum, Tragopogon, Tussilago, Verbesina, Vernonia, Xanthium,

Asteraceae (Aster Family): *Achillea millefolium* L. (Yarrow, Milfoil). Perennial forb. White petals. Aromatic. May–November. *Achillea millefolium forma rosea* Rand and Redf. has pink petals. TRP (few).

Asteraceae (Aster Family): *Anaphalis margaritacea* (L.) C. B. Clarke (Pearly Everlasting). Forb. White petals. July–September. Infructescences smell like butterscotch. BI.

Asteraceae (Aster Family): *Antennaria plantaginifolia* (L.) Richards (Plantain-leaved Everlasting). Perennial forb. April–June. BI.

Asteraceae (Aster Family): *Arnica acaulis* (Leopard's-bane). Perennial forb. BI.

Asteraceae (Aster Family): *Artemisa annua*. Annual forb. Native to Eurasia. Sweet scented annual forb. Greenish through yellow petals. TRP (few).

Asteraceae (Aster Family): *Erigeron philadelphicus* (Common Fleabane). Biennial forb. May. BI, TRP.

Asteraceae (Aster Family): *Hieracium venosum* L. (Rattlesnake-weed, Poor Robin's-plantain). Perennial forb. May. BI.

Asteraceae (Aster Family): *Krigia dandelion* (L.) Nuttall. (Potato Dandelion). Perennial forb, each plant with a tuber. Yellow petals.

Maryland endangered species. BI.

Asteraceae (Aster Family): *Krigia virginica* (L.) Willd. (Virginia Dwarf-dandelion). Perennial forb. April. BI.

Asteraceae (Aster Family): *Lactuca canadensis* L. (Wild Lettuce, Horseweed). Biennial forb. This plant has hairy stems and light yellow flowers in small heads. It can be weedy in yards. BI.

Asteraceae (Aster Family): *Prenanthes serpentaria* Pursh (Lion's-foot, Gall-of-the-Earth). Perennial forb. Pink, cream, through whitish petals. August – October. (BB 1984, 1064). TRP (10s).

Asteraceae (Aster Family): *Senecio cineraria* (Dusty Miller; *S. bicolor* subsp. *cineraria*, *S. candicans*, *S. maritimus*). Perennial forb. Europe. Yellow flowers in small heads. A common garden plant in the WDCA. Not invasive here. Often overwinters.

Asteraceae (Aster Family): □ *Packera aurea* (L.) A. & D. Löve, Golden Groundsel (*Senecio aureus* L., Golden Ragwort, Heart-leaved Groundsel, Ragwort, Squaw-weed, Staggerwort, St. Jameswort) (Laborador through MN and south through NC, AR, and FL Panhandle) [https://en.wikipedia.org/wiki/Packera\\_aurea](https://en.wikipedia.org/wiki/Packera_aurea) (perennial forb; yellow-orange disk and ray flowers in March–May, woodland habitat, light shade) (BI, PI, TRP)

Asteraceae (Aster Family): *Taraxacum officinale* G. H. Weber (Common Dandelion). Perennial forb. Yellow petals. January–December; can flower in all 12 months. BI, TRP. An alien, aggressive species. Native to Eurasia. Flowers produce nectar consumed by many arthropods including the American Bumble Bee, flower flies, the Northern Tiger Swallowtail, Polyester Bee, and Western Honey Bee.

Asteraceae (Aster Family): *Youngia japonica* (L.) DC. (Oriental False Hawksbeard). Native to Asia. Invasive, now in PA south through FL and west through TX, HI. <http://www.plants.usda.gov/java/profile?symbol=YOJA>. BI.

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Berberidaceae (Barberry Family): *Berberis*, *Caulophyllum*, *Jeffersonia*, *Mahonia*, *Podophyllum* (BB 1984, 481).

Berberidaceae (Barberry Family): *Caulophyllum thalictroides* (L.) Michaux (Blue Cohosh, Papoose-root). Perennial forb. Petals greenish through purplish. Common in the mountainous areas and rare in the Midlands of MD (BB 1984, 483). TRP (10s).

Berberidaceae (Barberry Family): *Jeffersonia diphylla* (L.) Persoon (Twinleaf). Perennial forb. April–May. White flowers that each last only about 2 days. BI, TRP.

Berberidaceae (Barberry Family): *Podophyllum peltatum* L. (Mayapple). Perennial forb. April–May. White flowers. Yellow, edible fruit. BI, TRP (1000s).

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Betulaceae (Birch Family): *Alnus* (3 MD spp.), *Betula* (4), *Carpinus* (1), *Corylus* (2), *Ostrya* (1)

Betulaceae (Birch Family): *Alnus serrulata* (Alder). Tree. March. BI.

Betulaceae (Birch Family): *Carpinus caroliniana* (Musclewood, Hornbeam). Tree. April. Pendant, yellow-green male catkins. Smooth, muscley bark, furrowed in older trunks. BI.

Betulaceae (Birch Family): *Ostrya virginica* (Hop Hornbeam, Ironwood). Tree. April. Pendant, yellow-green male catkins. Furrowed bark. BI.

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Boraginaceae (Borage Family):

Boraginaceae (Borage Family): *Onosmodium virginianum* (L.) A. DC. (False Groomwell). Perennial forb. Yellow-green petals. GFVA (4 plants). Extinct in MD.

Boraginaceae (Borage Family): *Mertensia virginica* (L.) Persoon (Bluebells, Virginia Bluebells, Virginia Cowslip). Perennial forb. Light blue, pink, or white petals. BI, TRP (10s).

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Brassicaceae (Mustard Family): *Alliaria*, *Alyssum*, *Arabidopsis*, *Arabis*, *Armoracia*, *Barbarea*, *Berteroa*, *Brassica*, *Cakile*, *Capsella*, *Cardamine*, *Cardaria*, *Camelina*, *Conringia*, *Cronopus*, *Dentarium*, *Descurainia*, *Diplotaxus*, *Erysimum*, *Eurucastrium*, *Eruca*, *Hesperis*, *Lepidium*, *Lobularia*, *Lunaria*, *Nasturtium*, *Raphanus*, *Rorippa*, *Sibara*, *Sisymbrium*, *Teesdalia*, *Thlaspi*.

Brassicaceae (Mustard Family): *Alliaria petiolata* (Garlic-mustard). Biennial forb. An alien, aggressive invasive species. Native to Eurasia. White petals. April–May. BI, TRP (1000s). Flowers produce nectar and pollen consumed by flower flies. Nectar is food of the Major Bee Fly, mining bees (*Andrena*), and sweat bees. This plant can form large colonies that crowd out native organisms in open areas of woods and along woodland edges. It is easy to pull out this plant from the ground. To control it, one should remove it before it sets seeds.

Brassicaceae (Mustard Family): *Arabis laevigata* (Smooth Rockcress). Forb. Lower leaves are toothed. April. BI.

Brassicaceae (Mustard Family): *Arabis lyrata* (Lyre-leaved Rockcress). Forb. Lower leaves are pinnate. April. BI.

Brassicaceae (Mustard Family): *Barbarea vulgaris* (Springcress, Wintercress, Yellow-rocket). Biennial forb. Native to Europe.

April–May. BI.

Brassicaceae (Mustard Family): *Capsella bursa-pastoris* (Shepherd's-purse). Biennial forb. Native to Europe. Edible silicles. BI.

Brassicaceae (Mustard Family): *Cardamine angustata* (*Dentaria heterophylla*, Slender Toothwort). Perennial forb. Glabrous; rounded, short leaflet teeth. April. BI.

Brassicaceae (Mustard Family): *Cardamine arenicola* (Tiny Sandcress). Perennial forb. BI.

Brassicaceae (Mustard Family): *Cardamine bulbosa* (Springcress). Perennial forb. Simple leaves. April. BI.

Brassicaceae (Mustard Family): *Cardamine concatenata* (*Dentaria laciniata*). Perennial forb. Hairy; long, acute leaflet teeth. March–April. BI.

Brassicaceae (Mustard Family): *Cardamine hirsuta* (Linnaeus) Medicus (Winter Cress, Bitter Cress). Biennial forb. Native to Eurasia. White petals. February–May. Pinnate leaves. BI, TRP (1000s). Flowers produce nectar and pollen consumed by flower flies and sweat bees, often late in the cold season before many other plants are in flower in the WDCA.

Brassicaceae (Mustard Family): *Erysimum repandum* (Treacle-mustard). Forb. Alien. Hairs are 2–5 branched. BI.

Brassicaceae (Mustard Family): *Lepidium campestre* (Fieldcress). Biennial forb. Native to Europe. Stem leaves are auricled (eared). April–May. BI.

Brassicaceae (Mustard Family): *Lepidium virginicum* (Wild Peppergrass). Biennial forb. Stem leaves are tapered. April–May. BI.

Cactaceae (Cactus Family): *Opuntia humifusa* (Raf.) Raf. (Eastern Pricklypear, Pricklypear, Indian-fig). Perennial forb. Yellow flowers. May–June. Green–reddish fruit. In extremely dry places, stems are almost round (rather than elongate) in outline. BI.

Callitrichaceae (Water-starwort Family): *Callitriche* (4 spp. in MD).

Callitrichaceae (Water-starwort Family): *Callitriche heterophylla* Pursh (Larger Water-starwort). Forb. Mud and standing water. Common throughout Maryland (Brown and Brown 1984, 634). BI.

Caprifoliaceae (Honeysuckle Family): *Lonicera*, *Sambucus*, *Viburnum*.

Caprifoliaceae (Honeysuckle Family): *Lonicera japonica* Carl Pehr Thunberg (Japanese Honeysuckle). Woody vine. Native in Asia. Highly invasive. Fragrant, nectariferous flowers which are white and turn to light yellow. BI (1000s), TRP (1000s). This plant covers many thousands of acres of forest floor where it crowds out native species including rare, hybrid ferns and wildflowers. Fruit is food of songbirds. Thickets of this plant are cover used by birds, mammals, and other wildlife. Nectar is food of bumble bees, flower flies, the Giant Carpenter Bee, Western Honey Bee, and other animals. The flowers of this plant are long and most insects cannot reach the nectar deep inside flowers with their tongues. Some bumble-bee species and the Giant Carpenter Bee bite holes in flower bases and obtain nectar through the holes (= nectar robbing), and many other arthropod species feed on this nectar through the holes.

Caprifoliaceae (Honeysuckle Family): *Lonicera fragrantissima*, Winter Honeysuckle Shrub. Native to Eurasia. White flowers. February–April. Very fragrant. Nectar and pollen are food of the Western Honey Bees (alien) and some species of flower flies.

Caprifoliaceae (Honeysuckle Family): *Lonicera maackii* (Amur Honeysuckle). Small tree. Alien. Highly invasive, distributed by the US Government for planting for wildlife in the past. May–June. White flowers changing to light yellow, green–red fruit. BI, TRP.

Caprifoliaceae (Honeysuckle Family): *Lonicera morrowii* (Morrow's Honeysuckle). Shrub. Alien. Each corolla base is swollen on one side. April–May. BI.

Caprifoliaceae (Honeysuckle Family): *Lonicera xylostemon* L. (European Fly-honeysuckle). Shrub. Alien. April. Near BI.

Caprifoliaceae (Honeysuckle Family): *Viburnum acerifolium* (Maple-leaved Viburnum). Shrub. 3-lobed leaves. April. White flowers. BI.

Caprifoliaceae (Honeysuckle Family): *Viburnum prunifolium* L. (Blackhaw). Small tree. April–May. White flowers. BI.

Caprifoliaceae (Honeysuckle Family): *Viburnum rafinesqueanum* Schultes (Downy Arrow-wood). Shrub. Big-toothed leaves with prominent veins. April–May. BI.

Caryophyllaceae (Pink Family): *Agrostema*, *Arenaria*, *Cerastium*, *Corrigiola*, *Dianthus*, *Holosteum*, *Honkenya*, *Lychnis*, *sMyosoton*, *Paronychia*, *Sagina*, *Saponaria*, *Scleranthus*, *Silene*, *Spergularia*, *Stellaria*.

Caryophyllaceae (Pink Family): *Cerastium arvense* (Field Chickweed). Biennial forb. 5 styles per pistil, petals are longer than sepals. April–May. BI.

Caryophyllaceae (Pink Family): *Cerastium vulgatum* (Common Mouse-eared Chickweed). Biennial forb. 5 styles per pistil, petals and sepals are the same length. April–May. BI.

Caryophyllaceae (Pink Family): *Silene caroliniana* (Wild Pink). Perennial forb. Pink petals, connate sepals. April–May. BI.

Caryophyllaceae (Pink Family): *Stellaria media* (Common Chickweed). Biennial forb. Native to Europe. 3 styles, petiolate leaves (1–3 cm long). January–December. White petals. BI, TRP (10s).

Caryophyllaceae (Pink Family): *Stellaria pubera* (Star Chickweed). Perennial forb. 3 styles per pistil, subsessile leaves (2–9 cm long). April–May. Prostrate fertile shoots, erect sterile shoots. BI, TRP.

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Celastraceae (Stafftree Family): *Celastrus*, Euonymous

Celastraceae (Stafftree Family): *Celastrus orbiculatus* (Asiatic Bittersweet). Woody vine. A major invasive from Asia. BI, TRP.

Celastraceae (Stafftree Family): *Euonymus alatus* (Thunberg) Sieb. (Winged Burningbush, Winged Euonomus). Tree. Native to Asia. Alien, major invasive in MD. May. BI, GFP, TRP (10s).

Celastraceae (Stafftree Family): *Euonymus americanus* L. (Strawberrybush). Shrub. May. Green flowers visited by ants, flies, *Panorpa helenae* (Helen's Scorpionfly).

Celastraceae (Stafftree Family): *Euonymus fortunei* Author? (Wintercreeper). Woody vine. Alien. Highly invasive. Green flowers. May.

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Cornaceae (Dogwood Family): *Cornus florida* L. (Eastern Flowering Dogwood, Flowering Dogwood). Tree. April–May. Yellowgreen flowers in groups surround by 4 white through pink bracts. April–May. BI, DMWP. Flowers produce nectar and pollen used by flower flies, small carpenter bees and other bees. The drupes of this plant are food of the Bobwhite, Eastern Gray Squirrel, Prairie Chicken, Ring-necked Pheasant (alien), Ruffed Grouse, Sharp-tailed Grouse, other small mammal species, many songbird species, and Wild Turkey. Stems and leaves are food of Eastern Cottontail Rabbits, White-tailed Deer, and the Dogwood Anthracnose Fungus which already killed thousands of trees of this species in the last few decades. This tree is a successional species and an understory tree. This is a wonderful plant for a native garden.

Cornaceae (Dogwood Family): *Cornus kousa*, Korean Dogwood. Alien, horticultural plant.

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Crassulaceae (Stonecrop Family): 6 spp. in MD (BB 1984, 539). *Sedum* (5 spp.), *Tillaea* (1 sp.).

Crassulaceae (Stonecrop Family): *Sedum acre* L. (Mossy Stonecrop). Perennial forb. Native to Europe. Forb. Yellow petals. June–July.

Crassulaceae (Stonecrop Family): *Sedum purpureum* (L.) Link (Live-forever). Perennial forb. Native to Europe. Forb. Purple petals.

Crassulaceae (Stonecrop Family): *Sedum sarmentosum* Bunge. Perennial forb. Native to Europe. Forb. Yellow petals. Escaped from gardens. April–June.

Crassulaceae (Stonecrop Family): *Sedum telephioides* Michaux (Wild Live-forever). Perennial forb. Light pink petals. August–September. BI.

Crassulaceae (Stonecrop Family): *Sedum ternatum* Michx. (Wild Stonecrop, Three-branched Stonecrop). Perennial forb. White petals. April–May. BI, TRP.

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Ericaceae (Heath Family): 33 spp. in MD. *Epigaea* (1), *Gaultheria* (1), *Gaylussacia* (4), *Kalmia* (2), *Leucothoe* (1), *Lyonia* (2), *Menziesia* (1), *Oxydendron* (1), *Rhododendron* (8), *Vaccinium* (12). (BB 1984, 247).

Ericaceae (Heath Family): *Epigaea repens* L. (Mayflower, Ground-laurel, Trailing Arbutus). Low Shrub. Pink petals, fragrant. April. Carderock, MD; WDC.

Ericaceae (Heath Family): *Gaylussacia baccata* (Wang.) K. Koch (Black Huckleberry). Shrub. White petals. May. Winter stems are all grayish. Fruits lustrous black, 6–8 mm in diameter, sweet and edible (BB 1984, 264). I have found the fruits dry and mealy. BI.

Ericaceae (Heath Family): *Kalmia latifolia* L. (Mountain-laurel, Ivy-laurel, Calico-bush). Shrub. White through pink petals. May–July. BI, TRP.

Ericaceae (Heath Family): *Leucothoe racemosa* (L.) Gray (Swamp Leucothoe, Fetterbush). Shrub. White petals. BI in vernal pond area.

Ericaceae (Heath Family): *Rhododendron periclymenoides* (*R. nudiflorum* (L.) Torrey, Pink Azalea, Pink-honeysuckle, Pinxter-flower). Shrub. BI, TRP (10s).

Ericaceae (Heath Family): *Vaccinium pallidum* Aiton (*V. vacillans*, Mountain Blueberry, Upland Blueberry). Shrub. White petals. Stamen tips included. May–June. Green stems in winter. BI.

Ericaceae (Heath Family): *Vaccinium corymbosum* L. (Highbush Blueberry). Shrub up to 4 m tall. White petals. April–May. BI.

Ericaceae (Heath Family): *Vaccinium stamineum* L. (Deerberry, Buckberry, Squaw-huckleberry). Shrub up to 3 m tall. White petals. Stamen tips exerted. April–June. “The fruits are tough and lack the usual blueberry flavor but can be used to make pies and amber-colored marmalade” (BB 1984, 270).

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Fabaceae (Pea Family): *Aeschynomene*, *Albizzia*, *Amorpha*, *Amphicarpa*, *Apios*, *Astragalus*, *Baptisa*, *Cassia*, *Centrosema*, *Cercis*, *Clitoria*,

Coronilla, Crotalaria, Cytisus, Desmanthus, Desmodium, Dolichos, Galactia, Gledistia, Glycine, Gymnocladus, Lathyrus, Lespedeza, Lotus, Lupinus, Medicago, Melilotus, Ononis, Pueraria, Phaseolus Psoralea, Rhynchosia, Robinia, Strophostyles, Stylosanthes, Trifolium, Vicia, Vigna, Wisteria

Fabaceae (Pea Family): *Cercis canadensis* L. (Eastern Redbud). Tree. White through magental petals. February (Florida) – May. FCSP, 1974 02 15, full bloom. S Nectar is food of the Giant Carpenter Bee and Western Honey Bee. Leaves are food of a species of leaf-folding moth and material used by leaf-cutting bees for their nest construction. This is a wonderful plant for a native garden.

Fabaceae (Pea Family): *Robinia pseudoacacia* Linnaeus (Black Locust). Tree. Fragrant, white flowers in May. Black Locust Witches'-broom is caused by the phytoplasma Bacteria: Firmicutes: Mollicutes: Acholeplasmatales: Acholeplasmataceae: Phytoplasma: 16SrIII (X-disease group). Nectar is food of the Giant Carpenter Bee and Western Honey Bee. Black Locust leaves are food of the Black Locust Leafminer (beetle), Evergreen Bagworm Moth, mirid bug, *Paraectopa robinella* (a leaf-mining moth), and a sawfly species. Twigs are food of the Locust Borer and a phytoplasma (of the Peach X Group) that causes this plant to grow witch's-brooms. This plant has root-nodule bacteria (*Rhizobium* sp.) that fix nitrogen and enrich soil. Trunks are food of *Fomes rimosus*, a rot-causing fungus that enters trunks through Locust Borer wounds and causes wood decay in living trees. This is a wonderful plant for a native garden.

Fabaceae (Pea Family): *Vicia* sp.(vetch). Perennial forb. BI.

Fabaceae (Pea Family): *Wisteria sinensis* (Sims) DC (Chinese Wisteria). Woody vine. This species is present at Great Falls Park. Perhaps the same species is at TRP.

Fagaceae (Beech Family): *Fagus* (1 sp. in MD), *Castanea* (3), *Quercus* (20)

Fagaceae (Beech Family): *Fagus grandifolia* Ehrh. (American Beech). Tree. Green flowers. April–May. Smooth, gray bark. (BB 1984, 63). Leaves and stems are food of the Eastern Tent Caterpillar, Gypsy Moth (alien), Imperial Moth, Io Moth, Leopard Moth, Luna Moth, other moth species, and the White-tailed Deer. Leaves are food of the Beech Leafminer Moth. Nuts are food of the American Black Bear, Common Raccoon, Eastern Chipmunk, Eastern Gray Squirrel, Northern Flying Squirrel, Red Squirrel, Ruffed Grouse, Wild Turkey, Wood Mouse, and Yellow-necked Mouse. Roots are food of Beechdrops (a fully parasitic plant). Note: “Beechdrops” is both a singular and plural word. American Beech is a wonderful plant for a native garden.

Fagaceae (Beech Family): *Castanea* (Chestnut). 1 sp. in MD.

Fagaceae (Beech Family): *Castanea dentata* (Marsh.) Borkh. (American Chestnut). Tree.

Fagaceae (Beech Family): *Castanea mollis* (Chinese Chestnut). Native to Asia. Tree.

Fagaceae (Beech Family): *Castanea pumila* (L.) Mill. (Chinquapin). Tree.

Fagaceae (Beech Family): *Quercus* (Oaks). 20 spp. in MD (BB 1984, 66).

Fagaceae (Beech Family): *Quercus alba* L. (White Oak). April. Tree.

Fagaceae (Beech Family): *Quercus palustris* Muenchh. (Pin Oak). April. Tree.

Fagaceae (Beech Family): *Quercus phellos* L. (Willow Oak). April. Tree.

Fagaceae (Beech Family): *Quercus lyrata* Walt. (Over-cup Oak, Swamp Post Oak). Tree. Rare in MD. Two large dead trees are in a globally rare upland-vernal-pond community on BI. In 2008, an American Beaver killed the remaining living tree by girdling the base of its trunk (Rod Simmons, pers. comm.). BB (1984) listed this species in MD as in Charles County and the Patuxent River Valley.

Fagaceae (Beech Family): *Quercus montana* (*Q. prinus* auct., not L.) (Chestnut Oak, Rock Oaks). Tree. April.

Fagaceae (Beech Family): *Quercus rubra* L. (*Q. borealis*, Northern Red Oak). Tree. April.

Fumariaceae (Fumitory Family): *Adluia*, *Corydalis*, *Dicentra*, *Fumaria*.

Fumariaceae (Fumitory Family): *Corydalis flavula* (Raf.) DC. (Pale Corydalis). Perennial forb. Yellow petals. April. TRP.

Fumariaceae (Fumitory Family): *Dicentra canadensis* (Goldie) Walp. (Squirrel-corn). Perennial forb. White petals. Heart-shaped flowers. April. TRP.

Fumariaceae (Fumitory Family): *Dicentra cucullaria* (L.) Bernh. (Dutchman's-breeches). Perennial forb. White petals. Trouser-shaped flowers. April. BI, TRP (1000s).

Geraniaceae (Geranium Family): *Erodium* (1 sp in MD), *Geranium* (8)

Geranium maculatum (Crane's-bill, Wild Geranium, Wood Geranium). Perennial forb. Light purple petals. April–May. BI, TRP (10s).

Hamamelidaceae (Witch-hazel Family): *Hamamelis*, *Liquidambar*

Hamamelidaceae (Witch-hazel Family): *Hamamelis venalis* Sargent (Ozark Witch-hazel). Tree. Native to Arkansas, Oklahoma, Texas, Missouri.

Hamamelidaceae (Witch-hazel Family): *Hamamelis virginiana* Carolus Linnaeus (Common Witch-hazel = *Café du Diable*, *Hamamélis de Virginie*, Snapping-alder, Southern Witch-hazel, Winter-bloom). Tree. Native to Ontario and Quebec south through Florida and Texas. Tree. Yellow flowers in autumn.

Hamamelidaceae (Witch-hazel Family): *Liquidambar styraciflua* L. (Sweetgum, Bilsted). Tree. DMWP.

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Hydrangeaceae (Hydrangea Family): *Hydrangea arborescens* L. (Wild Hydrangea). Shrub. White petals. TRP (10s).

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Hydrophyllaceae (Waterleaf Family): *Ellisia*, *Hydrophyllum*, *Nemophila*, *Phacelia*

Hydrophyllaceae (Waterleaf Family): *Ellisia nyctelea* L. (Ellisia). Perennial forb. White petals. Solitary flowers, opposite leaves. BI.

Hydrophyllaceae (Waterleaf Family): *Hydrophyllum canadense* (Broad-leaved Waterleaf). Forb. White petals. May. BI, TRP (1000s).

Hydrophyllaceae (Waterleaf Family): *Phacelia covillei* S. Watson (Blue Scorpionweed, Coville's Phacelia). Winter-annual forb. Light blue-violet petals. Glabrous filaments. April–May. BI, TRP (1000s).

Hydrophyllaceae (Waterleaf Family): *Phacelia dubia* (L.) Trel. (Small-flowered Phacelia). Forb. May. BI.

Hydrophyllaceae (Waterleaf Family): *Phacelia purshii* Buckl. (Miami-mist, Pursh's Phacelia). Forb. Fringed, bluish or white, petals. March–June. BI.

Hydrophyllaceae (Waterleaf Family): *Phacelia ranunculacea* (Nuttall) Const. Not in the WDCA.

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Hypericaceae (St. John's-wort Family): *Ascyrum* (2 spp. in MD), *Hypericum* (18 spp. in MD)

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Hypericaceae (St. John's-wort Family): *Hypericum prolificum* (Shrubby St. John's-wort). Shrub. Yellow petals. July. BI.

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Juglandaceae (Walnut Family): *Carya* (Hickories, 6 spp. in MD), *Juglans* (Walnuts, 2)

Juglandaceae (Walnut Family): *Carya cordiformis* (Wang.) K. Koch. (Bitternut Hickory, Swamp Hickory). Tree. May–June. Rusty-orange leaf buds. BI, TRP.

Juglandaceae (Walnut Family): *Carya tomentosa* Nuttall (Mockernut, White-heart Hickory). Tree. BI.

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Juglandaceae (Walnut Family): *Juglans cinerea* L. (Butternut, White Walnut). Tree. One planted tree at TRP.

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Lamiaceae (Mint Family): Agastache, Ajuga, Ballota, Blephilia, Collinsonia, Cunila, Dracocephalum, Galeopsis, Glechoma, Hedeoma, Lamium, Leonurus, Lycopus, Marrubium, Melissa, Mentha, Monarda, Nepeta, Origanum, Perilla, Physostegia, Pycnanthemum, Prunella, Scutellaria, Stachys, Teucrium, Thymus, Trichostema.

Lamiaceae (Mint Family): *Lamium purpureum* (Purple Dead-nettle). Native to Europe. Biennial forb. Purple petals. March–May.

Lamiaceae (Mint Family): *Glechoma hederacea* L. (Gill-over-the-ground, Ground-ivy). Perennial forb. Native to Europe. Invasive. Blue-violet petals. March–May. A nectar source of bumble bees, etc. The compound(s) in the leaves makes me sneeze.

Lamiaceae (Mint Family): *Perilla frutescens* (L.) Britton (Beefsteak-plant, Beefsteak-mint). Annual forb. Light blue-violet petals. Upright brownish plants with racemes of calyces often persist through the cold season. <http://plants.usda.gov/java/profile?symbol=PEFR4>. I saw English Sparrows consuming PF seeds from plants in my yard. TRP.

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Lauraceae (Laural Family): *Lindera* (1 sp. in MD), *Persea* (1), *Sassafras* (1)

Lauraceae (Laural Family): *Lindera benzoin* (L.) Blume (Spicebush). Tree. Yellow petals. March–April. Ovoid, red drupes. BI, TRP (100s). Nectar and pollen are food of some species of bees, flower flies, and other kinds of flies. Leaves and stems are food of the Spicebush Silkmoth (= Promethia Moth), and Spicebush Swallowtail. Fruit are food of some songbird species. This is a wonderful plant for a native garden.

Lauraceae (Laural Family): *Sassafras albidum* (Nuttall) Nees (Sassafras, White Sassafras). Tree. Yellow petals. Ovoid, blue drupes. April–May. Food of Spicebush Swallowtail.

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Linanthaceae (False Mermaid Family): *Floerkea proserpinacoides* Willd. (False-mermaid). Annual? forb. White petals, Trimerous flowers. April. BI, TRP.

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Magnoliaceae (Magnolia Family): *Liriodendron* (1 sp. in MD), *Magnolia* (3 native spp. in the WDCA)

Magnoliaceae (Magnolia Family): *Liriodendron tulipifera* L. (Tuliptree, Tulippoplar (a poor name)). Tree, up to 198 feet, that tallest tree in the Appalachians.. Green, orange, and yellow flowers. May. Flowers produce copious nectar and pollen used by the Polyester Bee, Ruby-throated Hummingbird, and Western Honey Bee. The nectar is food of ants including the False Honey Ant. Tuliptree leaves are food of the Eastern Tiger Swallowtail, Promethia Moth, Tuliptree Aphid, Tuliptree Scale, Tuliptree Sphinx Moth, Tuliptree Beauty Moth, White-tailed Deer. Leaf buds and flowers are food of the Eastern Gray Squirrel. This is a wonderful plant for a native garden.

Magnoliaceae (Magnolia Family): *Magnolia virginiana* L. (Small Magnolia, Swamp Magnolia, Swampbay, Sweetbay). Tree.

Magnoliaceae (Magnolia Family): *Magnolia ×soulangiana* (Saucer Magnolia). Tree. A hybrid of two species that are native to Asia. Noninvasive. Pink through purple tepals. Wonderful fragrance of “rose + cucumber.”

Montiaceae (Miner’s-lettuce Family): *Claytonia virginica* L. (*Phemeranthus virginica*, Spring-beauty). Perennial forb. Petals are white through light magenta (and ultraviolet) nectar guides. January (2006) – May. Flowers are heliotropic (track the Sun’s direction). *Andrena erigeniae* is a main pollinator of this plant. Leaves and stems are food of two similar *Puccinia* fungus spp., including *Puccinia mariae-wilsoniae* Clint., Spring-beauty Rust. BI, TRP (1000s). [after Colonial Virginia botanist John Clayton (1694–1773)]

Montiaceae (Miner’s-lettuce Family): *Claytonia virginica* var. *hammondiae* (Hammond’s Yellow Spring-beauty), native to Northwestern New Jersey, has yellow petals.

Nymphaeaceae (Waterlily Family): *Nuphar lutea* (Spatterdock). Perennial forb. Yellow petals. May. BI, DMWP.

Nyssaceae (Sourgum Family): *Nyssa sylvatica* Marsh. (Blackgum, Pepperidge, Sourgum). Tree. April–May. BI.

Oleaceae (Olive Family): *Chionanthus*, *Forsythia*, *Fraxinus*, *Ligustrum*, *Syringa*

Oleaceae (Olive Family): *Chionanthus virginicus* L. (Fringetree, Old-man’s-beard). Tree. White petals very fragrant. May.

Oleaceae (Olive Family): *Fraxinus americana* L. (White Ash). Tree. Purple stamens. Glabrous twigs. April–May. TRP (10s).

Oleaceae (Olive Family): *Fraxinus pennsylvanica* Marsh. (Red Ash). Tree. Glabrous through hairy twigs.

Orobanchaceae (Broom-rape Family):

Orobanchaceae (Broom-rape Family): *Conopholis americana* (L.) Wallr. (Squaw-root). Parasitic forb on roots of some tree species, especially oaks. Light yellow-brown petals. May. Visited by bumble bees. BI, TRP.

Orobanchaceae (Broom-rape Family): *Epifagus virginiana* (L.) Bartram (Beechdrops). Parasitic forb. Light brown petals. August–October. TRP.

Orobanchaceae (Broom-rape Family): *Orobanche uniflora* L. (One-flowered Cancersroot). Parasitic forb. Light blue-violet petals. May. BI, TRP.

Oxalidaceae (Wood-sorrel Family): *Oxalis* (8 spp. in MD).

Oxalidaceae (Wood-sorrel Family): *Oxalis stricta* L. (Upright Wood-sorrel). Forb. Yellow petals. May. ]Possibly this species in BI.

Oxalidaceae (Wood-sorrel Family): *Oxalis violacea* L. (Violet Wood-sorrel). Forb. Rose violet, through white petals. May. BI.

Papaveraceae (Poppy Family): *Chelidonium majus* Linnaeus (Greater-celandine, *Herbe aux Verrues* (Quebec)). Biennial forb. Native to Europe. Invasive. Yellow petals. May–September. Orange sap.

Papaveraceae (Poppy Family): *Eschscholzia californica* Adelbert von Chamisso (California Poppy). Annual forb. Native to Western US. A common garden plant.

Papaveraceae (Poppy Family): *Sanguinaria canadense* Linnaeus (Bloodroot, Red-puccoon). Perennial forb. White petals. Florida Caves St. Pk., 1974 02 15, fb; Bethesda, MD, 2007 03 25, first flower opens; Turkey Run Pk., 2008 04 05, fb.

Papaveraceae (Poppy Family): *Stylophorum diphyllum* (Michaux) Nuttall (Celandine -poppy, Mock-poppy, Wood-poppy). Forb. Native. PA through WI south through VA, TN, MO.

Phytolaccaceae (Pokeweed Family): *Phytolacca americana* L. (Pokeweed). Perennial forb. White petals. May–September. Nectar, pollen, or both are food of some bee, flower-fly, moth, and wasp species. Dark purple, juicy berries of the food of the American Robin, Catbird, Cedar Waxwing, Eastern Mockingbird, Mourning Dove, and Northern Cardinal. The fruits seem to intoxicate some bird species. Some birds produce watery bird-bombs (= feces) with many Pokeweed seeds that land on my car. This is a wonderful plant for a native garden. I continue to grow it despite the bird-bombs.

Platanaceae (Planetree Family): *Platanus occidentalis* (Eastern Sycamore). Tree. April–May.

Platanaceae (Planetree Family): *Platanus ×acerifolia* (Art.) Willd. Tree. Possibly *P. occidentalis* × *P. orientalis* L. There are many named



forms.

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Polemoniaceae (Phlox Family): *Phlox divaricata* (Blue Phlox, Woodland Phlox). Perennial forb. White through deep light purple and light blue-violet petals. April–May. TRP (100s)

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Polemoniaceae (Phlox Family): *Phlox subulata* (Mosspink). Perennial forb. White through lavender, purple, and pink petals. April–May.

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Polygonaceae (Knotweed Family): *Fagopyrum*, *Polygonum*, *Rumex*, *Tovara*.

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Portulacaceae (Portulaca Family): *Portulaca*

*Claytonia virginica* L. See Montiaceae (Miner's-lettuce Family).

*Talinum*. See Talinaceae.

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Portulacaceae (Portulaca Family): *Portulaca grandiflora* (Portulaca). Annual? forb. A garden plant. White through yellow, orange, pink, and red petals.

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Pyrolaceae (Pyrola Family): *Chimaphila umbellata* (Pipsissewa). Perennial forb. White petals. Evergreen leaves. TRP.

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Ranunculaceae (Buttercup Family): *Aconitum*, *Actaea*, *Anemone*, *Anemonella*, *Aquilegia*, *Caltha*, *Cimicifuga*, *Clematis*, *Coptis*, *Delphinium*, *Helleborus*, *Hepatica*, *Hydrastis*, *Ranunculus*, *Thalictrum*, *Trautvetteria*.

Ranunculaceae (Buttercup Family): *Anemone americana* (*Hepatica americana*, Round-lobed Hepatica). Perennial forb. White through pink, blue, and purple petals. March.

Ranunculaceae (Buttercup Family): *Anemone quinquefolia* (Wood Anemone). Perennial forb. White petals.

Ranunculaceae (Buttercup Family): *Aquilegia canadensis* (Eastern Columbine). Annual – perennial forb. Pink petals. April. Pollinated by long-tongued animals, e.g., Ruby-throated Hummingbird and sphinx moths.

Ranunculaceae (Buttercup Family): *Ficaria verna* William Hudson, 1762 (Lesser Celandine) (*Ranunculus ficaria* L., Fig-buttercup). Perennial forb. A major alien invasive plant in the WDCA. Glossy yellow petals. 3–4 sepals. DMWP, GAP.

Ranunculaceae (Buttercup Family): *Ranunculus abortivus* (Smallflowered Crowfoot). Perennial forb. Yellow petals. Subterrene basal leaves. April.

Ranunculaceae (Buttercup Family): *Ranunculus bulbosus* (Bulbous Buttercup). Perennial forb. Alien invasive plant. Glossy yellow petals. Stem bulblike at its base. April–June.

Ranunculaceae (Buttercup Family): *Ranunculus hispidus* var. *nitidus*, *R. septentrionalis*, Swamp Buttercup). Perennial forb. Basal and cauline leaves are similar in appearance. April–May.

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Ranunculaceae (Buttercup Family): *Thalictrum thalictroides* (*Anemonella thalictroides*, Rue Anemone). Perennial forb. April–May.

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Rosaceae (Rose Family): *Agrimonia*, *Alchemilla*, *Amelanchier*, *Aruncus*, *Crataegus*, *Dalibarda*, *Filipendula*, *Fragaria*, *Geum*, *Physocarpus*, *Porteranthus*, *Potentilla*, *Prunus*, *Pyrus*, *Rosa*, *Rubus*, *Sanguisorba*, *Sorbus*, *Spiraea*, *Waldsteinia*,

Rosaceae (Rose Family): *Amelanchier* Medic. 16 spp. in North America (Chris Frye 2009, <http://biology.umaine.edu/Amelanchier/Species.html>). About 8 spp. in MD (BB 1972 134). About 5 spp. in BI. One needs to key out specific trees to know their identities in many cases. “Eastern North American *Amelanchier* is an agamic complex (Campbell and Wright 1996), in which the combination of apomixis, polyploidy, and hybridization creates complex patterns of diversification. Understanding the evolution and advancing the systematics of *Amelanchier* require an appreciation of how diversification occurs in agamic complexes. Circumscription of species, which is particularly challenging in agamic complexes, is considered on the systematics page” (Campbell 2009, online).

Rosaceae (Rose Family): *Amelanchier arborea* (Downy Serviceberry). Tree. White petals. Lax inflorescence, leaves tomentose beneath. April.

Rosaceae (Rose Family): *Amelanchier canadensis* (Shadbush). Tree. White petals. Ascending inflorescence. April.

Rosaceae (Rose Family): *Amelanchier laevis* (Smooth Serviceberry). Tree. White petals. Lax inflorescence, glabrous undersides of leaves. April.

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Rosaceae (Rose Family): *Aruncus dioicus* (Walt.) Fernald (Goat's-beard). Perennial forb. White petals. SFlowers, late May – July. TRP (10s).

Rosaceae (Rose Family): *Duchesnia indica* (Henry C. Andrews) Focke (Indian-strawberry, Mock-strawberry). Perennial forb. Native to Asia. Highly invasive. Yellow petals; strawberrylike, insipid, red fruit; 3-toothed bractlets; 3 leaflets. FCSP, 1974 02 15.

Rosaceae (Rose Family): *Fragaria virginiana* Duchesne (Wild Strawberry, *Fraisier* in Quebec).

Rosaceae (Rose Family): *Malus malus* (L.) Britt. (*Malus sylvestris* P. Mill, *Pyrus malus*, Domestic Apple). Tree. White through pink petals; fragrant flowers. The Domestic Apple is derived from a population of *Malus sieversii* from Kazakhstan. This tree is still found wild in the mountains of Central Asia in southern Kazakhstan, Kyrgyzstan, Tajikistan, and Xinjiang, China. April. BI.

Rosaceae (Rose Family): *Potentilla canadensis* (Running Cinquefoil). Perennial forb. Yellow petals. Entire bractlets, 5 leaflets. April–May. BI.

Rosaceae (Rose Family): *Potentilla recta* L. (Upright Cinquefoil). Perennial forb. Native to Europe. Light yellow petals. May.

Rosaceae (Rose Family): *Prunus alleghaniensis* Porter (Alleghany Plum, Sloe). Tree. White petals. Maryland endangered tree.

Rosaceae (Rose Family): *Prunus americana* Marsh (American Wild Plum). Tree. White petals. Subumbellate inflorescences. Up to 8 m tall, forming thickets by means of root sprouts. This species is the source of several cultivated species.

Rosaceae (Rose Family): *Prunus avium* Carolus Linnaeus (Sweet Cherry, Bird Cherry). Tree. Native to Europe. White petals; dark red drupe; subumbellate inflorescence.

Rosaceae (Rose Family): *Prunus serotina* Frederick Ehrhart (Black Cherry, Cabinet Cherry, *Cerises d'automne*, *Cerisier Tardif*, Rum Cherry, Wild Black Cherry, Wild Cherry). Tree. White petals. Racemose inflorescence. Host of the Eastern Tent Caterpillar, Tiger Swallowtail, etc. TRP (10s, 1 large tree).

Rosaceae (Rose Family): *Prunus ×yedoensis* Nino Matsumara (Yoshino Cherry). Tree. Native to Asia. White through light pink petals. This is the predominant Cherry variety in downtown Washington, D.C. Cherry peak bloom in WDC is from 17 March (2000, an El Nino year) – 11 April (1993). Japan sent the first gift of 2000 cherry trees to the US in 1910. The US had to destroy those trees because of their disease. (<http://www.nps.gov/cherry/cherry-blossom-history.htm>)

Rosaceae (Rose Family): *Rubus flagellaris*? (Northern Dewberry). Shrub. White petals. May.

Rosaceae (Rose Family): *Rubus phoenicolasius* Carl Johann Maximowicz (Wineberry). Shrub. Native to Eastern Asia. Shrub. Highly invasive. Dense, reddish spines on stems. White petals. Purple, tasty fruit. Nectar and pollen if food of many bee species and other species. Fruit is food of birds (including the American Robin, Catbird, and Northern Mockingbird) and some stink-bug species. The stems which are hollow are nesting sites of small carpenter bees (*Ceratina* spp.).

Rosaceae (Rose Family): *Rubus* spp. (brambles) Shrubs. 8 species known from Great Falls Park, VA.

Rosaceae (Rose Family): *Rosa multiflora* Carl Pehr Thunberg ex Murray (Multiflora Rose). Shrub. An alien, aggressive species. Native to Eastern Asia. Highly invasive. White petals; fragrant. Nectar and pollen are food of bee, flower-fly, and other arthropod species. Thick growths of this plant are cover used by the Eastern Cottontail Rabbits and other small mammals and the Morning Dove, Quail, and other birds. Leaves are food of a fungus species that limits this plant's growth.

Rubiaceae (Madder Family): 21 spp. in MD. *Asperula* (2 spp.), *Cephalanthus* (1), *Dioidia* (1), *Galium* (14), *Houstonia* (1), *Oldenlandia* (1), *Mitchella* (1), *Sherardia* (1)

Rubiaceae (Madder Family): *Cephalanthus occidentalis* L. (Buttonbush). Tree. White petals. May–June. This species flowers in August in northern Michigan (pers. obs., 1962). Bumble bees, skipper butterflies, and other long-tongued insects take nectar from flowers of this plant.

Rubiaceae (Madder Family): *Galium aparine* L. (Goosegrass, Cleavers). Forb. White petals. April.

Rubiaceae (Madder Family): *Houstonia caerulea* L. (Bluets, Quaker-ladies). Perennial forb. Light blue-violet petals. April.

Rubiaceae (Madder Family): *Mitchella repens* L. (Partridgeberry). Woody vine. White petals. May. Red fruits.

Rutaceae (Rue Family): *Poncirus trifoliata*, Hardy-orange. Native to Asia. White petals. May.

Rutaceae (Rue Family): *Ptelea trifoliata* (Hop-tree). Tree. Alternate, trifoliolate leaves. May. BI.

Salicaceae (Willow Family): *Populus* (Poplars), *Salix* (Willows).

Salicaceae (Willow Family): *Populus deltoides* Marsh. (Eastern Cottonwood). Tree. April–May. Cottony seeds from capsules. Common in the Potomac Valley (BB 1972, 38). BI, DMWP (2009 04 07, expanding catkins).

Salicaceae (Willow Family): *Salix caprea*, Goat Willow (a kind of pussy willow). Native of Europe. Silver-gray flowers. February–March. Leaves are food of the Imported Willow Beetle (alien) and some other leaf-beetle species. Nectar and pollen are food of many bee and flower-fly species.

Salicaceae (Willow Family): *Salix gracilistyla* var. *melanostachys* (Black Pussy Willow). Native to Japan, Korea, and Manchuria. Black flowers, red pollen. March. Leaves are food of the Imported Willow Beetle (alien) and some other leaf-beetle species. Nectar and pollen are food of many bee and flower-fly species.

Salicaceae (Willow Family): *Salix nigra* Marsh. (Black Willow). Tree. Yellow-green catkins. April–June. Common throughout MD (BB 1972, 27). BI.

Santalaceae (Sandalwood Family): *Comandra umbellata* (L.) Nuttall (Bastard-toadflax). Hemiparasitic forb. White petals. April–May. BI.

Sapindaceae (Soapberry Family)

Sapindaceae : *Acer* (8 spp. in MD)

Sapindaceae (Soapberry Family): *Acer negundo* L. (Ash-leaved Maple, Boxelder). Dioecious tree. April. BI, TRP (100s).

Sapindaceae (Soapberry Family): *Acer rubrum* L. (Red Maple, Soft Maple, Swamp Maple). Monoecious tree. Red petals. February–March. BI, TRP (10s).

Sapindaceae (Soapberry Family): *Acer saccharinum* L. (River Maple, Silver Maple, White Maple). Monoecious tree. February–March. BI, TRP (10s).

Sapindaceae (Soapberry Family): *Acer saccharum* Marsh. (Sugar Maple). Monoecious tree. April. BI, TRP (10s).

Sarraceniaceae (Pitcher-plant Family): *Sarracenia purpurea* (Northern Pitcher-plant). Perennial forb. Purple petals (June–July). Nectar and pollen are food of some bee and flower-fly species. This plant consumes many species of arthropods.

Saxifragaceae (Saxifrage Family): *Astilbe*, *Chrysosplenium*, *Heuchera*, *Mitella*, *Parnassia*, *Penthorum*, *Saxifraga*, *Tiarella*

Saxifragaceae (Saxifrage Family): *Philadelphus* (4 spp. in MD), *Itea* (1), *Ribes* (4), *Saxifraga* (3).

Saxifragaceae (Saxifrage Family): *Heuchera americana* L. (Common Alumroot, Rock-geranium). Perennial forb. May. BI, TRP.

Saxifragaceae (Saxifrage Family): *Saxifraga virginensis* Michaux (Early Saxifrage). Perennial forb. White petals. March–April. BI, TRP.

Scrophulariaceae (Figwort Family): *Paulownia*, *Veronica*, etc.

Scrophulariaceae (Figwort Family): *Paulownia tomentosa* (Thunberg) Steud. (Empress-tree, Imperial-tree, Princess-tree). Tree. Alien, invasive; sacred in Japan. May. Removed from TRP.

Scrophulariaceae (Figwort Family): *Veronica hederifolia* L. (Ivy-leaved Speedwell). Annual forb. Native to Europe. Highly invasive. Light blue-violet petals. March–April.

Scrophulariaceae (Figwort Family): *Veronica persica* Poir (Bird’s-eye, Robin’s-eye). Annual forb. Native to Europe. Invasive. Light blue-violet petals. March–April.

Simaroubaceae (Quassia Family): *Ailanthus altissima* (Mill.) Swingle (Tree-of-heaven, Copal-tree). Tree. Alien invasive species. May.

Staphyleaceae (Bladdernut Family): *Staphylea trifolia* L. (American Bladdernut, Bladdernut). Tree. Yellow petals. Opposite, trifoliate leaves. April–May. BI, TRP.

Sterculiaceae (Cocoa Family, Chocolate Family): *Firmiana simplex* (Chinese Parasol-tree). Alien from Asia. Whitish petals. July. Nectar and pollen are food of bumble bees and other flower visitors. (Some place it in Malvaceae.)

Thymeliaceae (Mezereum Family): *Dirca palustris* L. (Leatherwood). Shrub. Yellow petals. April. Fruit and bark are poisonous to Humans if eaten and cause skin irritation in some people. One can tie a branch into a knot without breaking it. BI.

Tiliaceae (Linden Family): *Tilia* (2 spp. in MD)

*Tilia americana* L. (Basswood). Tree. Yellow-green petals. May–June.

Ulmaceae (Elm Family): *Celtis* (2 spp. in MD), *Ulmus* (4)

Ulmaceae (Elm Family): *Celtis occidentalis* (Hackberry, Sugarberry). Tree. April–May. Purple through black, ellipsoid drupes. Bark with lumps and warts. Plants sometimes have low buttresses.

Ulmaceae (Elm Family): *Ulmus americana* L. (American Elm, White Elm). Tree. February–March. Elliptic samaras. Leaf buds are broadly ovoids and somewhat flattened, 6–8 mm long, brown, glabrous through sparingly pubescent. Plants sometimes have low buttresses.

Ulmaceae (Elm Family): *Ulmus rubra* Muhl. (Red Elm, Slippery Elm). Tree. April. Leaf buds are ovoid, 5–7 mm long, nearly black with red hairs, becoming fuzzy later in winter.

Urticaceae (Nettle Family): *Boehmeria*, *Laportea*, *Pilea*, *Urtica*

Urticaceae (Nettle Family): *Urtica dioica* L. (Stinging Nettle). Perennial forb. Native to Europe. Invasive. June–September. This species can sting human skin.

Valerianaceae (Valerian Family):

Valerianaceae (Valerian Family): *Valeriana pauciflora* Michaux (Large-flowered Valerian). Perennial forb. Pale pink petals. TRP (100s). Rare in Maryland.

Violaceae (Violet Family): *Hybanthus* (1 sp. in MD), *Viola* (31)

Violaceae (Violet Family): *Hybanthus concolor* (Forst.) Spreng. (Green Violet). BI. Common in Western, MD; infrequent elsewhere.

Violaceae (Violet Family): *Viola bicolor* (*Viola rafinesquii* (Green) Fern., Field Pansy). Light blue-violet petals. April. BI.

Violaceae (Violet Family): *Viola pubescens* (*V. pennsylvanica* Michaux, Smooth Yellow Violet). Perennial forb. Yellow petals. BI.

Violaceae (Violet Family): *Viola sororia* Willd. (*V. papilionacea*, Common Blue Violet, Woolly Blue Violet). Perennial forb. Blue-violet petals. March–June.

Violaceae (Violet Family): *Viola striata* Aiton (Pale Violet). Perennial forb. White petals. April–May, autumn.

Violaceae (Violet Family): *Viola ×witrockiana* (*Viola altaica* × *cornuta* × *lutea* × *tricolor*), Pansy. Alien, usually temporarily invasive. A garden plant, hybrid from alien species with hundreds of cultivars. Is bigger better? The “Johnny-jump-up-type” *Viola* has flowers that are about 2 cm long by 1.5 cm wide. A monster Pansy that I bought in 2009 has flowers that were 9 cm long and 8 cm wide!

Vitaceae (Grape Family, Vine Family): *Ampelopsis* (2 spp. in MD), *Parthenocissus* (1), *Vitis* (6)

Vitaceae (Grape Family): *Ampelopsis brevipedunculata* (Maxim.) Trautv. (Porcelainberry). Woody vine. Highly aggressive, alien. Native to Asia. Nectar, pollen, or both are food of many bee, fly, and wasp species, including the Great Golden Digger Wasp and Green Bottle Fly.

Vitaceae (Grape Family): *Parthenocissus quinquefolia* (L.) Planch. (Virginia-creeper). Woody vine. Quinquifoliate leaves.

Vitaceae (Grape Family): *Vitis vulpina* L. (Chicken Grape, Winter Grape). Woody vine. A huge specimen with a braided trunk with missing heartwood lives in BI (2009).

Monocotyledonae

Lists: BWA (Shetler and Orli 2002), DMWP (Xu 1991, Haug 1993), GFV (Steury et al. 2008), PI (Killip and Blake, 1935, 1953; Shetler et al. 2006; Evans 2008, 27).

Alliaceae (Onion Family): *Allium*. See Amaryllidaceae (Amaryllis Family)

Amaryllidaceae (Amaryllis Family): *Allium canadense* L. (Meadow-garlic, Wild-onion). Perennial forb. White petals. May–June. Moist meadows, woodlands.

Amaryllidaceae (Amaryllis Family): *Allium sativa* L. (Garlic). Native to Western Asia. Petals white through green and purple. June–July. An occasional escapee from cultivation.

Amaryllidaceae (Amaryllis Family): *Allium tricoccum* Aiton (Wildleek, Ramp). Perennial forb. White petals. June–July. BI, TRP.

Amaryllidaceae (Amaryllis Family): *Allium vineale* L. (Wild-garlic, Field-garlic). Perennial forb. Native to Europe. An invasive plant that gives an unpleasant taste to milk from cows that eat this plant. White petals. Inflorescences have flowers, bulblets, or both. In fields, gardens, lawns, woodlands. BI, TRP.

Aloaceae (Aloe Family): See Asparagaceae (Asparagus Family).

Araceae (Arum Family): *Arisaema triphyllum* (Jack-in-the-pulpit). Perennial forb. April–May. Shoots of this species are female, male, hermaphroditic, or sterile. In excellent sites, shoots tend to be female. In lower quality sites, shoots tend to be male. BI, TRP.

Asparagaceae (Asparagus Family): *Convallaria*, *Hyacinthus*, *Muscari*, *Yucca*.

Asparagaceae (Asparagus Family): *Convallaria majalis* L. (Lily-of-the-valley). Perennial forb. Native to Europe. Escapes from gardens and forms patches. What a wonderful fragrance!

Aparagaceae (Asparagus Family): *Hyacinthus orientalis* L. (Hyacinth). Perennial forb. Native to Eurasia. This is the Hyacinth of gardens that flowers in spring and has a wonderful fragrance (at least if it is not too concentrated). I have not seen this species invade natural US habitats.

Aparagaceae (Asparagus Family): *Muscari botryoides* (L.) Mill. (Grape-hyacinth). Perennial forb. Native of Europe. Blue-violet through white petals. Some flowers are double. April–May. Leaves appear in late fall. BI.

Asphodelaceae (Asphodel Family): Aloe, Gasteria, Haworthia, Hemerocallis, and others

Asphodelaceae (Asphodel Family): *Hemerocallis flava* L. (Lemonlily, Lemon Daylily). Perennial forb. Native to Asia. Invasive. One of the approximately 10 *Hemerocallis* species that are the parents of about 80,000 *Hemerocallis* cultivars and the basis of many Daylily societies worldwide.

Asphodelaceae (Asphodel Family): *Hemerocallis fulva* L. (Common Daylily, Fulvous Daylily, Tigerlily). Perennial forb. Native to Asia. Invasive. May–June. Triploid, rare sets seeds. One of the approximately 10 *Hemerocallis* species that are the parents of about 60,000 *Hemerocallis* cultivars and the basis of many Daylily societies worldwide. TRP.

Cyperaceae (Sedge Family): Bulbostylis, Carex, Cladium, Cymophyllus, Cyperus, Dulichium, Eleocharis, Eriophorum, Fimbristylis, Fuirena, Hemicarpha, Psilocarya, Rhynchospora, Scleria, Scirpus. 100s of spp. in MD (BB 1984, 198).

Cyperaceae (Sedge Family): *Carex* (Sedges)

Cyperaceae (Sedge Family): *Carex careyana* Torrey (Carey's Sedge). Perennial forb. May–June. [after John Carey] (BB 1984, 281). BI.

Cyperaceae (Sedge Family): *Carex pensylvanica* Lam. (Pennsylvania Sedge). Perennial forb. April–June. Frequent in dry or sandy soil, open or rocky woods, of the Coastal Plain and Piedmont Provinces (BB 1984, 265). BI.

Dioscoriaceae (Yam Family): *Dioscorea*. 4 spp in MD.

Hemerocallidaceae (Daylily Family): See Asphodelaceae

Hyacinthaceae (Hyacinth Family): See Asparagaceae.

Iridaceae (Iris Family): Belamcanda, Iris, Sisyrinchium (BB 1984, 361).

Iridaceae (Iris Family): *Sisyrinchium angustifolium* (Blue-eyed-grass). Perennial forb. Blue tepals. April–May. BI.

Juncaceae (Rush Family): *Juncus*, *Luzula*.

Juncaceae (Rush Family): *Luzula echinata* (Small) F. J. Herm. (Sea-urchin-like Wood Rush). April–June. BI.

Liliaceae (Lily Family): Aletris, Amianthium, Camassia, Chamaelirium, Clintonia, Disporum, Helonias, Lilium, Maianthemum, Medeola, Narthecium, Ornithogalum, Polygonaum, Stenanthium, Streptopus, Tofieldia, Uvularia, Veratrum, Xerophyllum, Zigadenus

Liliaceae (Lily Family): *Erythronium albidum* (white trout-lily). Perennial forb. White tepals. March–April. BI.

Liliaceae (Lily Family): *Erythronium americanum* (yellow trout lily). Perennial forb. Yellow tepals. March–April. BI.

Liliaceae (Lily Family): *Lilium superbum* L. (Turk's-cap Lily). Perennial forb. Orange tepals. July–August. Frequent through MD (BB 1984, 337).

Liliaceae (Lily Family): *Lilium tigrinum* Ker. (Tiger Lily). Perennial forb. Native to Asia. Orange tepals. Escapes from gardens to roadsides and an persists in some old home sites.

Liliaceae (Lily Family): *Ornithogalum nutans* L. (Star-of-Bethlehem). Perennial forb. Native to Europe. White tepals. April–June.

Liliaceae (Lily Family): *Ornithogalum umbellatum* L. (Star-of-Bethlehem). Perennial forb. Native Europe. White tepals. Larger flowers than *O. nutans*. April–June.

Liliaceae (Lily Family): *Polygonatum biflorum* (Walt.) Ell. (Dwarf Solomon's-seal). Perennial forb. Green petals. May. BI.

Liliaceae (Lily Family): *Smilacina racemosa* (L.) Desf. (False Solomon's-seal, False Spikenard). Perennial forb. White petals. May. BI.

Liliaceae (Lily Family): *Uvularia sessilifolia* L. (Strawlily, Sessile-leaved Bellwort). Perennial forb. May. BI, GFP.

Hostaceae (Hosta Family): See Aparagaceae.

Melanthiaceae: *Melanthium*, *Trillium*, etc.

Melanthiaceae (Bunchberry Family): *Trillium maculatum* Rafineque (Wake-robin). Perennial forb. Yellowish or reddish petals. SE USA. FCSF, 1974 02 15, fb.

Melanthiaceae (Bunchberry Family): *Trillium sessile* Linnaeus (Toadshade, Toad Trillium). Perennial forb. Yellowish or reddish petals. TRP, 2008 04 05, fb, tight groups of up to 25 flowers. BI, TRP.

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Orchidaceae (Orchid Family): 44 spp. in MD. (BB 1984, 367).

Orchidaceae (Orchid Family): *Aplectrum hyemale* (Muhl.) Torrey (Adam-and-Eve Orchid, Puttyroot Orchid). Perennial forb. Petals and sepals yellowish brown through purplish, labellum almost white. May–June. Elliptic through ovate, corrugated leaves usually persist through the cold season and die before plants flower. Garrett County, Lower Midland, Cecil and Talbot Counties; frequent.

Orchidaceae (Orchid Family): *Epipactis helleborine* (L.) Crantz (Broadleaf Helleborine Orchid, Helleborine Orchid). Perennial forb. Native of Europe and possibly North America. Present in many areas of North America. Greenish yellow petals and sepals tinged with purple. June–October. Woods. Rare in MD. I saw it flowering in mid-October in Waitsfield, VT in mid-October 2006.

Orchidaceae (Orchid Family): *Tipularia discolor* (Pursh) Nuttall (Cranefly Orchid). Perennial forb. Brownish petals and sepals. July–August. Leaves are green above and purplish beneath, persisting through the cold season, but dying before the plant flowers. BI. Western and Eastern Shores of Maryland; infrequent.

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Poaceae (Grass Family): 100s of spp in North America, 10s of spp. in MD (BB 1984, 65).

Poaceae (Grass Family): *Anthoxanthum odoratum* L. (Sweet Vernal Grass). Perennial grass. Native to Europe. April–August. BI.

Poaceae (Grass Family): *Avena sativa* L. (Oats). May–June. Cultivated throughout MD, not invasive (BB 1984, 145).

Poaceae (Grass Family): *Deschampsia caespitosa* (L.) Beauv. (Tufted Hairgrass). Perennial grass.

Poaceae (Grass Family): *Deschampsia flexuosa* (L.) Trin. (Crinkled Hair Grass). Perennial grass. June–August. Leaves long, inrolled or almost hairlike, variously curved (BB 1984, 143). BI.

Poaceae (Grass Family): *Hordeum vulgare* L. (Barley). Crop plant. Not invasive (BB 1984, 192).

Poaceae (Grass Family): *Muhlenbergia schreberi* Gmel. (Nimbelwill). Perennial grass. July–November. Common in MD. Often in “weedy” lawns.

Poaceae (Grass Family): *Muhlenbergia sobolifera* (Muhl.) Trin. (Branched Muhly Grass). Perennial grass. July–October. BI, in vernal-pond area.

Poaceae (Grass Family): *Panicum boscii*. This species is in Dan Nicolson’s list but not in Brown and Brown (1984). BI.

Poaceae (Grass Family): *Phalaris arundinacea* (Reed Canary Grass). Perennial grass. June–August. Rare or local on the Coastal Plain in MD (BB 1984, 117). Abundant and forms monocultures in Michigan.

Poaceae (Grass Family): *Phleum pratense* L. (Common Timothy Grass, Herds’ Grass, Timothy). Perennial grass. Native to Europe. June–August. (BB 1984, 129).

Poaceae (Grass Family): *Poa* L. (Blue Grass, Meadow Grass, Spear Grass). 11 spp in MD (BB 1984, 163).

Poaceae (Grass Family): *Poa annua* L. (Annual Blue Grass, Spear Grass). Native to Europe. A common lawn grass, considered a bad weed by some persons. March. BI.

Poaceae (Grass Family): *Poa cuspidata* Nuttall (Short-leaved Blue Grass). Perennial grass. March–June. BI.

Poaceae (Grass Family): *Poa sylvestris* Gray (Sylvan Blue Grass). April–June. BI.

Poaceae (Grass Family): *Secale cereale* L. (Rye). April–May. Not invasive (BB 1984, 192).

Poaceae (Grass Family): *Triticum aestivum* L. (Wheat). September–October. Not invasive (BB 1984, 190). A trigeneric cross.

Poaceae (Grass Family): *Uniola paniculata* L. (*Chasmanthium paniculatum*, Sea-oats). Perennial grass. June–July. Coastal sand dunes in MD (BB 1984, 175).

Poaceae (Grass Family): *Uniola latifolia* Michaux (*Chasmanthium latifolium*, Wild-oats). Perennial grass. Most woods, frequent in the Potomac Valley from Cumberland, MD, south (BB 1984, 175). BI.

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Poaceae (Grass Family): *Zizania aquatica* L. (Wild-rice). Perennial grass. Common in estuaries of the Chesapeake Bay (BB 1984, 115)

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Smilicaceae (Greenbriar Family): *Smilax* (Greenbriars). 10 spp, in MD. Stems of woody species are green in the cold season.

Smilicaceae (Greenbrier Family): *Smilax herbacea* Michaux (Carrion-flower). Perennial nonwoody vine. Green petals, flowers with odor of carrion. April–May. Black berries. Flies are frequent on flowers, and may pollinate them. TRP (rare).

Smilicaceae (Greenbrier Family): *Smilax rotundifolia* L. (Common Greenbrier, Catbrier, Horsebrier, Round-leaf Greenbrier). Perennial woody vine. Green petals. April–June. People cook and eat young tender shoots (BB 1972, 21). BI.

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Trilliaceae (Trillium Family): See Melanthiaceae (Bunchberry Family)
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#### Part 6. Eucarya: Protista.

This Kingdom contains many algal species and many 1-celled organisms including *Euglena* and *Paramecium*. Some green algae are taxonomically in Kingdom Plantae and some are in Protista. I put all of them in Protista (below) for convenience.

John D. Hall and Susan Carty found 68 taxa of green algae during the 2006 Bioblitz (Evans 2008, 18). This is the first such survey for the Potomac Gorge.

Phylum Charophyta

Phylum Chlorophyta

Chrysophyceae

Phylum Euglenophyta

Xanthophyceae

Slim Molds  
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[has Equisetum, etc. 720 spp and 9 varieties, of which 648 were known from the Island and 72 from only the mainland.]

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Vegetation Data Legend

Potomac Gorge, Maryland and Virginia

(21 March 2009, list by the National Park Service with some annotations by E. M. Barrows)

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1. Mesic Mixed Hardwood Forest (hardwood forest = angiospermous forest)

2. Eastern Hemlock – Hardwood Forest

3. Dry-Mesic Chestnut Oak – Northern Red Oak Forest

4. Dry-Mesic Acidic Oak – Hickory Forest

5. Chestnut Oak Forest

6. Basic Mesic Hardwood Forest

7. Rich Cove – Mesic Slope Forest (Twinleaf – Blue Cohosh Type)

8. Rich Red Oak – Sugar Maple Forest

9. Bedrock Terrace Oak – Hickory Forest

10. Rich Boulderfield Forest

11. Riverside Outcrop Woodland

12. River Floodplain Complex

13. River Floodplain Forest

14. Siver Maple Floodplain Forest

15. Terrace hardwood Floodplain Forest

16. Ice-Scour Floodplain Forest

17. Bedrock Floodplain Oak Forest

18. Tuliptree Small-stream Floodplain Forest

19. Maple-Ash Swamp Forest

20. Pin Oak – Swamp White Oak Forest

21. Red Maple Seepage Swamp

22. Upland Depression Willow Oak Swamp Forest

23. Successional Virginia Pine Forest (a kind of gymnospermous forest)

24. Successional Boxelder Floodplain Forest

25. Successional Tuliptree Forest (Circumneutral Type)

26. Successional Black Walnut Forest

27. Successional Mixed Deciduous Vine Forest

- 28. Depositional Bar and Shore Vegetation
- 29. Bedrock Floodplain Woodland
- 30. Sycamore – River Birch Scour Woodland

- 31. River Scour Woodland
- 32. Riverside Rock Outcrop and Prairie Complex
- 33. Riverwash Bedrock Prairie
- 34. Disturbed Woody Wetland
- 35. Disturbed Herbaceous Wetland

- 36. Mixed Deciduous Shrubland (Vine Shrubland)
- 37. Successional Meadow – Grassland
- 38. Open Water
- 39. Developed, Open Space
- 40. Developed, Low Intensity

- 41a. Developed, Medium Intensity
- 41b. Developed, Medium Intensity (George Washington Memorial Parkway)
- 41c. Developed, Medium Intensity (Glen Echo, MD)

- 42a. Developed, high intensity (Central Intelligence Agency, Federal Highway Administration, Turner-Fairbank Highway Research Center)
- 42b. Developed, high intensity (Glen Echo Park, MD)

- 44. Claude Moore Colonial Farm (Turkey Run Park)
- 45. Langley Fork Park (Athletic Fields, Hiking Trail)
- 46. Langley Oaks Park
- 47. Turkey Run Recreation Area.

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