ECOLOGICAL COMMUNITY TYPE 1.1. – FORESTED WETLANDS CLASS

***Quercus palustris – Quercus bicolor – Fraxinus pennsylvanica* / *Saururus cernuus – Cinna arundinacea – Carex tribuloides* Forest**

Pin Oak – Green Ash / Lizard-Tail – Wood Reed Grass – Blunt Broom Sedge Forest

PIEDMONT / MOUNTAIN SWAMP FOREST

**Habitat and Distribution:**  This community type occurs in seasonally flooded sloughs and backswamps in the Bull Run floodplain, both north and south of US Highway 29. It covers 11.23 ha (27.7 ac), or < 1% of the Park. Sampling sites have hummock-and-hollow microtopography, with typical flooding depth of 20 to 25 cm (8 to 10 in) in the hollows. In the largest and deepest slough, located approximately 1.25 km N of US 29, maximum flooding depth is approximately 50 cm (20 in). Habitats are probably completely inundated by temporary but major floods every 1-3 years. They typically have shallow, standing water for much of the winter and spring, but are usually well drawn-down by summer. Soils are mapped as silt loams but samples collected in the field are heavy, red to reddish-brown loamy clays, typically with orange mottling in the upper horizon. A-horizon samples are very strongly to extremely acidic, but have moderately high Ca, Mg, and Mn levels.

**Composition and Physiognomy:**

Constant Species (constancy ≥ 80%):

*Aster lateriflorus*, *Boehmeria cylindrica*, *Carex tribuloides*, *Cinna arundinacea*, *Fraxinus pennsylvanica*, *Impatiens capensis*, *Leersia virginica*, *Lycopus virginicus*, *Microstegium vimineum*, *Quercus palustris*, *Toxicodendron radicans*, *Ulmus americana*.

Dominant Species (mean cover ≥ 6):

*Fraxinus pennsylvanica* (8), *Quercus palustris* (7), *Ulmus americana* (7), *Cinna arundinacea* (6), *Saururus cernuus* (6), *Quercus bicolor* (6), *Acer negundo* (6)

Diagnostic Species (fidelity = 100% and mean cover > 1):

*Alisma subcordatum*, *Allium canadense* var. *canadense*, *Carex lupulina*, *Carex stipata* var. *maxima*, *Carex stipata* var. *stipata*, *Carex typhina*, *Cephalanthus occidentalis*, *Cicuta maculata* var. *maculata*, *Glyceria septentrionalis*, *Ludwigia palustris*, *Mimulus alatus*, *Poa autumnalis*, *Polygonum hydropiperoides*, *Rumex verticillatus*, *Saururus cernuus*, *Scutellaria lateriflora*, *Scutellaria nervosa*, *Viola cucullata*.

Indicator Species (highest unscaled adj. IVs):

*Saururus cernuus*, *Carex tribuloides*, *Cinna arundinacea*, *Fraxinus pennsylvanica*, *Carex grayi*, *Allium canadense* var. *canadense*, *Carex lupulina*, *Carex typhina*, *Scutellaria lateriflora*, *Boehmeria cylindrica*.

Vegetation is a well-developed forest with an overstory co-dominated by *Quercus palustris* (pin oak), *Quercus bicolor* (swamp white oak), and *Fraxinus pennsylvanica* (green ash). In the deepest sloughs, *Fraxinus pennsylvanica* alone dominates the overstory. Mean canopy height in three sampled stands is 31 m (103 ft) and the dominant overstory trees range from 35 to 80 cm (14 to 31 in) in diameter at breast height. An open to dense understory is usually dominated by *Ulmus americana* (American elm) and *Fraxinus pennsylvanica*. *Acer rubrum* (red maple) is also a frequent overstory and understory associate. Trees in this community are often festooned with high-climbing lianas of *Toxicodendron radicans* (poison-ivy). Frequent shrubs include *Carpinus caroliniana* (American hornbeam) and *Viburnum prunifolium* (black haw).

The herb layer is characterized by water-tolerant graminoids and forbs. The deeper hollows are usually dominated by clonal patches of *Saururus cernuus* (lizard’s-tail), while *Cinna arundinacea* (wood reed grass) and a variety of sedges occupy slightly better-drained hummocks. The latter include *Carex caroliniana* (Carolina sedge), *C. festucacea* (fescue sedge), *C. grayi* (Asa Gray sedge), *C. louisianica* (Louisiana sedge), *C. lupulina* (hop sedge), *C. radiata* (stellata sedge), *C. squarrosa* (squarrosa sedge), *C. stipata* var. *stipata* (stalk-grain sedge), *C. tribuloides* (blunt broom sedge), and *C. typhina* (cat-tail sedge). Other characteristic herbs include *Aster lateriflorus* (goblet aster), *Boehmeria cylindrica* (false nettle), *Glyceria striata* (fowl manna grass), *Impatiens capensis* (spotted jewelweed), *Leersia virginica* (Virginia cutgrass), *Lycopus virginicus* (Virginia bugleweed), *Lysimachia ciliata* (fringed loosestrife), and *Scutellaria lateriflora* (mad-dog skullcap).

**Distinguishing Features:**  This community type is distinguished by its development in relatively wet floodplain habitats and by its herbaceous composition featuring patch-dominance of *Saururus cernuus* and hydrophytic sedges. Its overstory composition is similar to that of the Upland Depression Swamp community type, which occurs in sluggish, non-alluvial upland depressions and meandering, low-relief headwaters stream bottoms with little if any active alluvial deposition.

**Global Conservation Rank:** G?

**State Conservation Rank:** S3?

**Synonymy:** This vegetation can probably be considered a variant of SAF Cover Type 65: Pin Oak – Sweetgum. Currently, there is no clear crosswalk to any USNVC association, but the type is clearly related to associations in the *Quercus palustris* – (*Quercus bicolor*) Seasonally Flooded Forest Alliance (A.329). It is anticipated that a new association will be defined for this vegetation in the near future.

**Comments:** This swamp forest association is widespread along larger stream and rivers in the Culpeper Basin and scattered elsewhere in the northern Virginia and Maryland Piedmont and the Ridge and Valley province of western Virginia. More plot data are needed from throughout the range to firm up characterization over a broader geographic area.

*Microstegium vimineum* (eulalia) and *Poa trivialis* (rough bluegrass) are problematic exotics that readily invade the better-drained hummock microhabitats.

**Representative Plots and Examples:**  MNBP01, MNBP03, MNBP16. Stands of this community along Bull Run just N and just S of US Rt. 29 are considered to represent a small, but significant occurrence of the type. Portions of these stands are mature, with impressively large oaks, and have a representative diversity of understory and herbaceous species.

ECOLOGICAL COMMUNITY TYPE 1.2. – FORESTED WETLANDS CLASS

***Quercus bicolor – Quercus palustris* / *Viburnum prunifolium* / *Scirpus atrovirens* Woodland**

Swamp White Oak – Pin Oak / Black Haw / Dark-Green Bulrush Woodland

UPLAND DEPRESSION SWAMP

**Habitat and Distribution:**  This community type occupies shallow, seasonally flooded upland basins and wet, elongate bottoms along small streams. In aggregate, it covers 11.47 ha (28.3 ac), or < 1% of the Park. Because of the Culpeper Basin’s low relief, headwater drainages area very diffuse, with sluggish, usually intermittent flows and little or no active alluvial deposition. Within this physiographic context, it can be difficult to distinguish true isolated wetlands from small stream bottoms. Hydrologically, these habitats are comparable, with shallow seasonal flooding induced by perched water tables during the winter and spring months. Hydroperiods, however, can apparently be irregular and unpredictable. Maximum flooding depth is usually < 25 cm (10 in). A-horizon soils are dark brown to blackish, loamy clays which typically exhibit pronounced orange and white mottling. Samples collected from four plot-sampling sites varied from extremely to moderately acidic, with high Ca, Mg, and Al levels but only moderate total base saturation.

**Composition and Physiognomy:**

Constant Species (constancy ≥ 80%):

*Cinna arundinacea*, *Fraxinus pennsylvanica*, *Impatiens capensis*, *Juncus tenuis*, *Juniperus virginiana*, *Leersia virginica*, *Lonicera japonica*, *Parthenocissus quinquefolia*, *Quercus bicolor*, *Quercus palustris*, *Rubus flagellaris*, *Scirpus atrovirens*, *Smilax rotundifolia*, *Toxicodendron radicans*, *Viburnum prunifolium*.

Dominant Species (mean cover ≥ 6):

*Quercus bicolor* (7), *Quercus palustris* (7), *Fraxinus pennsylvanica*, (7), *Viburnum prunifolium* (6), *Acer rubrum* (6), *Ulmus americana* (6).

Diagnostic Species (fidelity = 100% and mean cover > 1):

*Acer platanoides*, *Agrimonia parviflora*, *Amelanchier stolonifera*, *Aster lanceolatus*, *Carex annectens*, *Carex frankii*, *Carex gracilescens*, *Carex granularis*, *Carex laevivaginata*, *Carex muhlenbergii*, *Carex pellita*, *Carex vulpinoidea*, *Celtis tenuifolia*, *Cirsium muticum*, *Dichanthelium acuminatum* var. *acuminatum*, *Dichanthelium acuminatum* var. *lindheimeri*, *Dichanthelium sphaerocarpon* var. *sphaerocarpon*, *Eleocharis tenuis* var. *tenuis*, *Galium obtusum* var. *filifolium*, *Galium tinctorium*, *Gratiola neglecta*, *Ilex verticillata*, *Juncus acuminatus*, *Mikania scandens*, *Onoclea sensibilis*, *Poa pratensis*, *Polygonum pensylvanicum*, *Polygonum persicaria*, *Polygonum sagittatum*, *Potentilla simplex*, *Prunella vulgaris* ssp. *lanceolata*, *Sanicula odorata*, *Scirpus atrovirens*, *Scirpus pendulus*, *Smilax herbacea*, *Solidago juncea*, *Stachys pilosa* var. *arenicola*, *Zanthoxylum americanum*.

Indicator Species (highest unscaled adj. IVs):

*Quercus bicolor*, *Leersia virginica*, *Carex granularis*, *Scirpus atrovirens*, *Fraxinus pennsylvanica*, *Impatiens capensis*, *Quercus palustris*, *Carex vulpinoidea*, *Solidago juncea*, *Glyceria striata*.

Vegetation is an open forest or woodland (mean canopy cover = 65%) dominated by well-formed *Quercus bicolor* (swamp white oak) and *Quercus palustris* (pin oak). Mean canopy height in four plot samples is 31 m (103 ft) and dominant overstory trees range from 35 to 72 cm (14 to 28 in) diameter at breast height. *Fraxinus pennsylvanica* (green ash) is a frequent overstory associate and often prevalent in a sub-canopy layer. Additional understory tree associates include *Acer rubrum* (red maple), *Diospyros virginiana* (persimmon), and *Ulmus americana* (American elm). *Carya* spp. (hickories) often grow along the margins of the wetland habitats. *Viburnum prunifolium* (black haw) is the leading shrub dominant, with densities up to 850 stems/ha recorded in plots. Minor shrubs include *Celtis tenuifolia* (Georgia hackberry), *Ilex verticillata* (winterberry), *Lindera benzoin* (spicebush), and *Zanthoxylum americanum* (northern prickly-ash). Small individuals of *Juniperus virginiana* var. *virginiana* (eastern red cedar) usually grow on wetland edges and hummocks, while *Toxicodendron radicans* (poison ivy) and *Parthenocissus quinquefolia* (Virginia creeper) are common, climbing liana.

The herb layer is usually open (mean stratum cover = 55%) and characterized by diverse graminoids. Locally common, often patch-dominant species include *Carex granularis* (meadow sedge), *Carex pellita* (woolly sedge), *Carex squarrosa* (squarrosa sedge), *Eleocharis tenuis* var. *tenuis* (slender spikerush), *Glyceria striata* (fowl manna-grass), *Leersia virginica* (Virginia cut grass), and *Scirpus atrovirens* (dark-green bulrush). *Arisaema triphyllum* (jack-in-the-pulpit) and *Impatiens capensis* (spotted jewelweed) are the most abundant forbs and may dominate some areas. Other minor but characteristic herbs include *Carex gracilescens* (slender sedge), *Carex vulpinoidea* (fox sedge), *Dichanthelium acuminatum* var. *lindheimeri* (tapered panic grass), *Galium obtusum* (bluntleaf bedstraw), *Juncus tenuis* (slender rush), *Pycnanthemum tenuifolium* (narrow-leaved mountain-mint), and *Scirpus pendulus* (reddish bulrush).

**Distinguishing Features:** This community type may be distinguished by its occurrence in isolated wetlands and wet, amorphous stream-bottoms with no active alluvial processes. Its overstory composition is similar to that of the Piedmont / Mountain Swamp Forest community type, which occurs in seasonally flooded backswamps and sloughs in the floodplain of Bull Run. Its herbaceous composition, however, is notably different and lacks many of the prevalent floodplain species such as *Saururus cernuus* (lizard’s-tail), *Glyceria septentrionalis* (eastern manna-grass), *Carex typhina* (cat-tail sedge), *Carex lupulina* (hop sedge), *Allium canadense* (meadow onion), and *Cicuta maculata* (water-hemlock).

**Global Conservation Rank:**  G1G3

**State Conservation Rank:**  S2?

**Synonymy:** This vegetation can probably be considered a variant of SAF Cover Type 65: Pin Oak – Sweetgum. It is represented in the USNVC by CEGL004643: *Quercus palustris – Quercus bicolor* / *Carex* spp. Forest .

**Comments:** *Isoetes appalachiana* (Appalachian quillwort) is a state-rare plant species that has been recorded in semi-aquatic habitats (e.g., shallow, sluggish streams and hollows) within stands of this community type. The state-rare *Stachys pilosa* var. *arenicola* (marsh hedgenettle) is also associated but usually occurs in slightly better-drained microhabitats.

Noticeable herbivory by white-tailed deer on herbaceous plants was observed at least twice in Upland Depression Swamps of the Park. Several exotic plants were recorded in plots of this community type, including *Lonicera japonica* (Japanese honeysuckle), *Poa compressa* (flat-stemmed bluegrass), *Poa trivialis* (rough bluegrass), and *Rosa multiflora* (multiflora rose). These and other exotics are largely confined to the better-drained hummock microhabitats. At present, *Lonicera japonica* is the only problematic exotic, attaining mean covers of 5-10% in two plots.

**Representative Plots and Examples:**  MNBP04, MNBP05, MNBP06, MNBP11. Occurrences of this community type are scattered throughout the Park. Outstanding examples are found at the east base of Stuarts Hill, south of US Rt. 29 opposite Battery Heights, and on Bald Hill.

ECOLOGICAL COMMUNITY TYPE 1.3. – FORESTED WETLANDS CLASS

***Ulmus americana – Acer negundo* – (*Platanus occidentalis*)/ *Asimina triloba – Lindera benzoin* / *Asarum canadense* Forest**

American Elm – Boxelder / Paw-Paw – Spicebush / Wood Nettle – Wild Ginger Forest

PIEDMONT / MOUNTAIN BOTTOMLAND FOREST

**Habitat and Distribution:** This association type covers 86.45 ha (214 ac), or 5% of the Park. Habitats are elevated floodplain levees and terraces bordering Bull Run, Youngs Run, and a few other secondary streams. These sites are probably completely inundated by temporary but major floods every 1-3 years, but are otherwise moderately well-drained to well-drained. Soils from plot-sampling sites are very strongly acidic, reddish-brown, alluvial silt loams with moderately high Ca and Mg levels, and high Mn levels.

**Composition and Physiognomy:**

Constant Species (constancy ≥ 80%):

*Acer negundo*, *Alliaria petiolata*, *Asarum canadense*, *Asimina triloba*, *Aster lateriflorus*, *Carex amphibola* var. *turgida*, *Carex blanda*, *Carex jamesii*, *Carex radiata*, *Carya cordiformis*, *Celtis occidentalis*, *Festuca subverticillata*, *Fraxinus pennsylvanica*, *Galium aparine*, *Geum canadense*, *Juglans nigra*, *Laportea canadensis*, *Lindera benzoin*, *Lonicera japonica*, *Microstegium vimineum*, *Parthenocissus quinquefolia*, *Sanicula canadensis*, *Smilax tamnoides*, *Ulmus americana*, *Verbesina alternifolia*, *Viburnum prunifolium*, *Viola pubescens* var. *pubescens*, *Viola sororia*, *Viola striata*, *Vitis vulpina*.

Dominant Species (mean cover ≥ 6):

*Acer negundo* (7), *Asimina triloba* (7), *Ulmus americana* (7), *Carex jamesii* (6), *Carya cordiformis* (6), *Lindera benzoin* (6), *Microstegium vimineum* (6).

Diagnostic Species (fidelity = 100% and mean cover > 1):

*Cardamine hirsuta*, *Impatiens pallida*, *Laportea canadensis*, *Mertensia virginica*, *Poa sylvestris*, *Quercus shumardii*, *Senecio aureus*, *Stellaria media*, *Verbesina occidentalis*, *Viola pubescens* var. *pubescens*.

Indicator Species (highest unscaled adj. IVs):

*Viola pubescens* var. *pubescens*, *Laportea canadensis*, *Quercus shumardii*, *Microstegium vimineum*, *Acer negundo*, *Carex jamesii*, *Carex blanda*, *Carex radiata*.

Plot data were collected from two relatively mature stands of this association along Bull Run. These sites have mixed overstories (30 to 32 m [98 to 105 ft] tall) of *Carya cordiformis* (bitternut hickory), *Celtis occidentalis* (hackberry), *Fraxinus pennsylvanica* (green ash), *Juglans nigra* (black walnut), *Liriodendron tulipifera* (tulip-poplar), *Quercus palustris* (pin oak), *Quercus shumardii* (Shumard oak), and *Ulmus americana* (American elm). Although not recorded in plot samples, *Platanus occidentalis* (American sycamore) is a frequent associate in these stands. *Acer negundo* (boxelder) is generally dominant in a sub-canopy layer (15 to 20 m [49 to 66 ft] tall). Climbing lianas of *Toxicodendron radicans* (poison ivy) and *Vitis* spp. (grapes) are common in the sub-canopy and canopy. The shrub and small tree layers are moderately dense with *Acer negundo*, *Asimina triloba* (paw-paw), *Carpinus caroliniana* (American hornbeam), and *Lindera benzoin* (spicebush). The herb layer of this alluvial forest is lush with nutrient-demanding species such as *Asarum canadense* (wild ginger), *Carex amphibola* var. *turgida* (a sedge), *Carex jamesii* (Nebraska sedge), *Cystopteris protrusa* (lowland brittle fern), *Festuca subverticillata* (nodding fescue), *Floerkea proserpinacoides* (false mermaid-weed), *Laportea canadensis* (wood nettle), *Mertensia virginica* (Virginia bluebells), *Senecio aureus* (golden ragwort), *Viola pubescens* var. pubescens (downy yellow violet), and *Viola striata* (striped violet). Many other herbs occur at low cover and/or constancy.

Large floodplain areas in the Park were cleared and utilized for agriculture in the past. These areas now support degraded or early-successional variants of the association described above. Composition of such stands is extremely variable but often consists of nearly monospecific dominance by *Acer negundo*, or mixtures of *Platanus occidentalis* and other hardwoods. Invasive exotics shrubs such as *Rosa multiflora* (multiflora rose) are typically abundant, along with exotic and weedy native herbs such as *Verbesina alternifolia* (wingstem).

**Distinguishing Features:** The relatively well-drained floodplain habitats, lush herb layer, and prevalence of alluvial-soil trees such as *Platanus occidentalis* and *Acer negundo* make this community type distinctive within the Park. It is most similar to, and shares a number of species with, the Piedmont / Mountain Swamp Forest. However, the latter is characterized by an abundance of *Quercus palustris* (pin oak) and *Quercus bicolor* (swamp white oak), which are minor to absent in the well-drained floodplains, as well as by more water-tolerant hydrophytic herbs such as *Saururus cernuus* (lizard’s-tail) and coarse sedges (*Carex typhina*, *Carex lupulina*, etc.).

**Global Conservation Rank:**  G4

**State Conservation Rank:**  S4

**Synonymy:** This vegetation has affinities to both SAF Cover Type 61: River Birch – Sycamore and Cover Type 60: Silver Maple – American Elm. The association appears to be equivalent to USNVC CEGL007334: *Platanus occidentalis - Acer saccharinum - Juglans nigra - Ulmus rubra* Forest, which is reported to occur along fertile riverfronts throughout the east-central United States.

**Comments:** These fertile floodplain forests are more prone to invasion by exotic plant species than any other community type in the MNBP. Abetted by fertile soils and continuous dispersal by floodwaters, shade-tolerant exotics such as *Alliaria petiolata* (garlic-mustard), *Microstegium vimineum* (eulalia), *Stellaria media* (common chickweed), *Glechoma hederacea* (ground-ivy), and *Poa trivialis* (rough bluegrass) are generally rampant even in mature, undisturbed stands. Young and heavily-disturbed stands often contain an abundance of ruderal weeds such as *Festuca pratensis* (meadow fescue). The impact of exotics in floodplain forests is pervasive throughout the mid-Atlantic region. Conspicuous herbivory by white-tailed deer was noted in one of the two sample plots.

**Representative Plots and Examples:** MNBP02, MNBP29. The most mature and representative stands are located along Bull Run, just south of US Rt. 29.

ECOLOGICAL COMMUNITY TYPE 2.1. – BASIC UPLAND FORESTS CLASS

***Fraxinus americana – Carya cordiformis – Quercus muhlenbergii* / *Staphylea trifolia* / *Hydrophyllum virginianum – Carex jamesii* Forest [PROVISIONAL]**

White Ash – Bitternut Hickory – Chinquapin Oak / Bladdernut / Virginia Waterleaf – Nebraska Sedge Forest
BASIC MESIC FOREST

**Habitat and Distribution:** This vegetation is confined in the Park to a short, steep (28º slope), east-facing bluff bordering the inner edge of the Bull Run floodplain, from about 0.75 to 1.35 km (0.5 to 0.9 mi) NW of US Rt. 29. Bedrock underlying the bluff is siltstone of the Ball’s Bluff Formation. The habitat appears to be moist and well-drained, with deep, friable, silt loam soils. A sample of the latter was moderately acidic, with high Ca, Mg, and Mn levels, indicating high fertility. This community covers 1.55 ha (3.83 ac), or < 1% of the Park.

**Composition and Physiognomy:**

Constant Species (constancy ≥ 80%):

not applicable because the type is represented by a single plot; see Table of Floristic Composition.

Dominant Species (mean cover ≥ 6):

*Asimina triloba* (7), *Celtis occidentalis* (7), *Carex jamesii* (7), *Ulmus rubra* (7), *Carya cordiformis* (6), *Fraxinus americana* (6), *Quercus muhlenbergii* (6), *Hydrophyllum virginianum* (6).

Diagnostic Species (fidelity = 100%):

*Arisaema dracontium*, *Hydrangea arborescens*, *Hydrophyllum virginianum*, *Poa cuspidata*, Q*uercus muhlenbergii*, *Staphylea trifolia*.

Indicator Species (highest unscaled adj. IVs):

*Hydrophyllum virginianum*, *Quercus muhlenbergii*, *Staphylea trifolia*, *Arisaema dracontium*, *Carex jamesii*, *Hydrangea arborescens*, *Poa cuspidata*, *Cystopteris protrusa*.

Forest vegetation of this association is a mixed mesophytic hardwood forest with overstory co-dominance by *Carya cordiformis* (bitternut hickory), *Fraxinus americana* (white ash), *Celtis occidentalis* (hackberry), *Quercus muhlenbergii* (chinkapin oak), *Quercus rubra* (northern red oak), and *Ulmus rubra* (slippery elm). The understory tree layers are sparse, but the shrub layer contains moderate to high cover of *Asimina triloba* (paw-paw), *Cercis canadensis* var. *canadensis* (eastern redbud), *Lindera benzoin* (spicebush), and *Staphylea trifolia* (bladdernut). The herb layer is lush with nutrient-demanding species and characterized by patch-dominance of *Cystopteris protrusa* (lowland brittle fern), *Hydrophyllum virginianum* (Virginia waterleaf), *Carex jamesii* (Nebraska sedge), *Asarum canadense* (wild ginger), *Elymus hystrix* var. *hystrix* (bottlebrush grass), and *Festuca subverticillata* (nodding fescue). Noteworthy herbaceous species found here outside the plot include *Hybanthus concolor* (green violet), *Erigenia bulbosa* (harbinger-of-spring), *Myosotis macrosperma* (large-seeded forget-me-not), and *Triosteum perfoliatum* (perfoliate tinker’s-weed).

**Distinguishing Features:**  Although the shrub and herbaceous flora of this community is similar to those of the Piedmont / Mountain Bottomland Forest, the overstory is dominated by upland oaks, hickories, and white ash. This association can be readily distinguished by its steep, bluff-like habitat and the prevalence of *Quercus muhlenbergii* and *Staphylea trifolia*, species rarely found elsewhere in the Park.

**Global Conservation Rank:**  G?

**State Conservation Rank:**  S?

**Synonymy:** None. This community does not have any current analogues among SAF cover types or USNVC associations. It is most similar to basic mesic forests that occur on fertile, river-fronting slopes along the Potomac, James, and Shenandoah Rivers in Virginia. However, it lacks a number of species characteristic of and abundant in those forests, most notably *Acer saccharum* (sugar maple), *Tilia americana* (American basswood), *Jeffersonia diphylla* (twinleaf), and *Hydrophyllum canadense* (Canada waterleaf). Further studies are needed to place this provisional vegetation type in a larger regional context.

**Comments:** Like the fertile floodplains, the habitat of this community type is very favorable for shade-tolerant, invasive exotics, especially *Alliaria petiolata* (garlic-mustard) and *Microstegium vimineum* (eulalia). Snags and dying trees of *Cornus florida* (flowering dogwood) were also observed, indicating the presence of the fungal pathogen *Discula destructiva* (dogwood anthracnose).

**Representative Plots and Examples:**  MNBP17. This vegetation is restricted to a steep, linear bluff bordering the Bull Run floodplain north of the Stone Bridge. This stand is unique among Park forests, has considerable floristic and ecological interest, and should be protected from disturbance. Currently, a horse trail traverses the north end of the stand as it drops from the upland into the Bull Run lowlands.

ECOLOGICAL COMMUNITY TYPE 2.2. – BASIC UPLAND FORESTS CLASS

***Quercus alba – Carya glabra – Fraxinus americana* / *Cercis canadensis* / *Muhlenbergia sobolifera – Dichanthelium boscii* Forest**

White Oak – Pignut Hickory – White Ash / Eastern Redbud / Cliff Muhly – Bosc's Panic Grass Forest

BASIC OAK-HICKORY FOREST

**Habitat and Distribution:** This association is widespread in MNBP, primarily on soils weathered from diabase but also locally on soils weathered from siltstone. It covers 231.34 ha (572 ac), or 13% of the Park. Stands occupy low ridges and rolling to flat uplands (mean slope = 4º). Plot-sampling sites were subjectively assessed as submesic or subxeric; TRMI values (mean = 30 for 10 stands) also indicate intermediate site moisture conditions. Surface substrate of most sampling sites consisted of thin leaf litter, with small patches of bare mineral soil exposed in places. Five plots had at least 1% surface cover of spheroidal diabase boulders or stones. Soils collected from plots were very strongly to moderately acidic clay loams with moderately high Ca and Mg, and very high Mn levels. Most soils occupied by this community probably have a hardpan subsoil and some may have pronounced shrink-swell properties.

**Composition and Physiognomy:**

Constant Species (constancy ≥ 80%):

*Agrimonia rostellata*, *Carex albicans* var. *australis*, *Carex complanata* var. *hirsuta*, *Carya glabra*, *Celtis occidentalis*, *Cercis canadensis* var. *canadensis*, *Cornus florida*, *Dichanthelium boscii*, *Elymus hystrix* var. *hystrix*, *Fraxinus americana*, *Galium circaezans*, *Juniperus virginiana* var. *virginiana*, *Lonicera japonica*, *Muhlenbergia sobolifera*, *Oxalis dillenii*, *Parthenocissus quinquefolia*, *Quercus alba*, *Quercus rubra*, *Rosa carolina*, *Rubus flagellaris*, *Sanicula canadensis*, *Scutellaria elliptica*, *Symphoricarpos orbiculatus*, *Thalictrum thalictroides*, *Viburnum prunifolium*, *Viola palmata* var. *triloba*, *Vitis vulpina*.

Dominant Species (mean cover ≥ 6):

*Carya glabra* (7), *Cercis canadensis* var. *canadensis* (7), *Quercus alba* (7), *Fraxinus americana* (6), *Quercus rubra* (6), *Carya ovalis* (6).

Diagnostic Species (fidelity = 100% and mean cover > 1):

*Agrimonia pubescens*, *Agrimonia rostellata*, *Aristolochia serpentaria*, *Asclepias quadrifolia*, *Botrychium virginianum*, *Calystegia spithamaea* ssp. *spithamaea*, *Carex rosea*, *Chionanthus virginicus*, *Cynoglossum virginianum* var. *virginianum*, *Elaeagnus umbellata* var. *parvifolia*, *Festuca rubra*, *Galium concinnum*, *Hedeoma pulegioides*, *Helianthus divaricatus*, *Krigia dandelion*, *Liparis liliifolia*, *Muhlenbergia sobolifera*, *Quercus stellata*, *Rubus occidentalis*, *Solidago ulmifolia* var. *ulmifolia*, *Uvularia perfoliata*.

Indicator Species (highest unscaled adj. IVs):

*Dichanthelium boscii*, *Cercis canadensis* var. *canadensis*, *Muhlenbergia sobolifera*, *Agrimonia rostellata*, *Thalictrum thalictroides*, *Botrychium virginianum*, *Elymus hystrix* var. *hystrix*, *Phryma leptostachya*.

Vegetation of this unit is a mixed hardwood forest dominated by oaks and hickories. *Quercus alba* (white oak) and *Carya glabra* (pignut hickory) are the leading overstory dominants, especially among large-diameter (> 40 cm dbh) trees. *Quercus rubra* (northern red oak) and *Carya ovalis* (red hickory) are frequent overstory co-dominants, while *Quercus stellata* (post oak), *Fraxinus americana* (white ash), *Carya alba (*mockernut hickory), *Juglans nigra* (black walnut), and *Quercus velutina* (black oak) are occasional overstory associates. Sub-canopy tree layers are usually dominated by young hickories and *Fraxinus americana*. Characteristic species in the shrub and small tree layers are *Cercis canadensis* var. *canadensis* (eastern redbud; dominant with up to 850 stems/ha in some areas), *Juniperus virginiana* var. *virginiana* (eastern red cedar), *Cornus florida* (flowering dogwood), *Ostrya virginiana* (eastern hophornbeam), *Ulmus rubra* (slippery elm), *Celtis occidentalis* (hackberry), *Carpinus caroliniana* (American hornbeam), and *Chionanthus virginicus* (fringetree). The herb layer of this community is characterized by patch-dominance of three dry-site forest grasses – *Muhlenbergia sobolifera* (cliff muhly), *Dichanthelium boscii* (Bosc’s panic grass), and *Elymus hystrix* var. *hystrix* (bottlebrush grass). Co-occurring among the dominant grasses are a large number of low-cover forbs and graminoids, among the most diagnostic of which are *Acalypha virginica* (Virginia copperleaf), *Ageratina altissima* (white snakeroot), *Agrimonia rostellata* (woodland agrimony), *Aristolochia serpentaria* (Virginia snakeroot), *Asclepias quadrifolia* (four-leaved milkweed), *Botrychium virginianum* (rattlesnake fern), *Clematis ochroleuca* (curly-heads), *Cynoglossum virginianum* (wild comfrey), *Galium circaezans* (forest bedstraw), *Geum virginianum* (cream avens), *Hedeoma pulegioides* (American pennyroyal), *Helianthus divaricatus* (woodland sunflower), *Phryma leptostachya* (lopseed), *Solidago ulmifolia* var. *ulmifolia* (elm-leaved goldenrod), *Thalictrum thalictroides* (rue-anemone), *Uvularia perfoliata* (perfoliate bellwort), and *Viola palmata* var. *triloba* (three-lobed violet). Many additional species occur at low cover and/or constancy. This unit has a mean species richness of 66 taxa per 400 m2, the highest among classified types at MNBP.

**Distinguishing Features:** This community is distinguished by its diverse floristic composition, its abundance of *Carya* spp. and *Fraxinus americana*, and the patch-dominance of three distinctive forest grasses. It is quite similar to the Acidic Oak-Hickory Forest, but has lusher and more diverse shrub and herb layers that lack significant cover of *Vaccinium pallidum* (early lowbush blueberry) and other heath shrubs. This unit is largely confined to soils weathered from diabase, whereas the Acidic Oak-Hickory Forest is exclusively associated with soils weathered from siltstone.

**Global Conservation Rank:**  G?

**State Conservation Rank:** S3

**Synonymy:** This vegetation can probably be considered a variant of SAF Cover Type 52: White Oak – Black Oak – Northern Red Oak. It is not currently represented in the USNVC, but its review and probable incorporation is pending.

**Comments:** This vegetation type has been well documented by DCR-DNH ecologists in Virginia, where it is the principal oak-hickory forest on basic substrates of the northern Virginia Culpeper Basin. Outlying patches also occur on Catoctin metabasalt (greenstone) of the western Piedmont foothills and lower Blue Ridge, as well as on other mafic substrates (amphibolite, gabbro) of the northern and central Piedmont. The global range of this community needs investigation, but is likely to include the Frederick Basin in Maryland and similar geologic areas north to lower New England. Farrell and Ware (1991) and Ware (1992) reported strong positive correlations of *Carya* importance values with high Ca, Mg, and pH in studies involving 75 upland hardwood stands in the Virginia Piedmont. Although high-base soils in these studies were confined to the northern Virginia Culpeper Basin, DCR-DNH ecologists have found this pattern to be more widespread and recurrent on soils weathered from a variety of mafic, ultramafic, intermediate metamorphic, and calcareous metasedimentary substrates throughout the Virginia Piedmont and mountains (Fleming and Coulling 2001, Fleming 2002). All of the Park’s Basic Oak-Hickory Forests have been cut in the past, and many appear to have been grazed. The rather dry soils occupied by this community keep many exotic plants in check, but the drought-tolerant *Lonicera japonica* (Japanese honeysuckle) and *Symphoricarpos orbiculatus* (coralberry, a shrub naturalized from the western U.S.) are problematic invaders. Other disturbances recorded at sampling sites included heavy herbivory by white-tailed deer (6 plots) and snags of *Cornus florida* killed by the fungal pathogen *Discula destructiva* (dogwood anthracnose).

**Representative Plots and Examples:**  MNBP07, MNBP08, MNBP10, MNBP12, MNBP14, MNBP15, MNBP22, MNBP24, MNBP31, MNBP32. Excellent, mature examples occur on the ridge just east of Brawner Farm, south of US Rt. 29 opposite Battery Heights, and on the ridge south of Sudley.

ECOLOGICAL COMMUNITY TYPE 3.1. – ACIDIC UPLAND FORESTS CLASS

***Quercus alba – Quercus velutina – Carya alba* / *Cornus florida* / *Vaccinium pallidum* Forest**

White Oak – Black Oak – Mockernut Hickory / Flowering Dogwood / Early Lowbush Blueberry Forest

ACIDIC OAK-HICKORY FOREST

**Habitat and Distribution:** This association is widespread in MNBP on soils weathered from Ball’s Bluff siltstone. It covers 120.95 ha (299 ac), or 6% of the Park. Stands occupy low ridges and rolling to flat uplands (mean slope = 6º), usually on slopes that are convex in at least one direction. Most plot-sampling sites were subjectively considered subxeric, an assessment that is generally supported by TRMI values (mean = 23 for 7 stands). Surface substrate of most sampling sites consisted of thin leaf litter, with small patches of bare mineral soil. Small siltstone boulders or stones were exposed in three plots. The surficial soil horizon, below the leaf litter, usually consisted of 1 to 4 cm of dense, root-rich duff and humus. Soils collected from plots were very strongly to extremely acidic silt or silty clay loams with low base status.

**Composition and Physiognomy:**

Constant Species (constancy ≥ 80%):

*Carya alba*, *Carya glabra*, *Chimaphila maculata*, *Cornus florida*, *Desmodium nudiflorum*, *Fraxinus americana*, *Gaylussacia baccata*, *Juniperus virginiana* var. *virginiana*, *Parthenocissus quinquefolia*, *Prunus serotina* var. serotina, *Quercus alba*, *Quercus rubra*, *Quercus velutina*, *Vaccinium pallidum*, *Vaccinium stamineum*.

Dominant Species (mean cover ≥ 6):

*Quercus alba* (8), *Carya alba* (7), *Carya ovalis* (6), *Cornus florida* (6), *Gaylussacia baccata* (6), *Quercus rubra* (6), *Quercus velutina* (6), *Vaccinium pallidum* (6), *Vaccinium stamineum* (6).

Diagnostic Species (fidelity = 100% and mean cover > 1):

*Carex tonsa*, *Comandra umbellata* ssp. *umbellata*, *Lysimachia quadrifolia*, *Rhododendron periclymenoides*.

Indicator Species (highest unscaled adj. IVs):

*Gaylussacia baccata*, *Vaccinium pallidum*, *Vaccinium stamineum*, *Quercus velutina*, *Carya alba*, *Chimaphila maculata*, *Hieracium venosum*, *Amelanchier arborea*.

This association is a mixed oak or oak-hickory forest in which *Quercus alba* (white oak) is by far the leading overstory dominant. *Quercus velutina* (black oak), *Quercus rubra* (northern red oak), *Carya alba* (mockernut hickory), *Carya ovalis* (red hickory), *Carya glabra* (pignut hickory), and *Quercus coccinea* (scarlet oak) are frequent but comparatively minor overstory associates. Sub-canopy tree layers are usually dominated by hickories, but *Acer rubrum* (red maple), *Nyssa sylvatica* (black gum), and *Sassafras albidum* (sassafras) may be locally abundant. Minor understory trees include *Fraxinus americana* and *Juniperus virginiana* var. *virginiana* (eastern red cedar), neither of which is nearly as important as in the Basic Oak-Hickory Forest. Characteristic species in the shrub layer are *Cornus florida* (flowering dogwood), *Amelanchier arborea* (downy serviceberry), young hickories, and *Vaccinium stamineum* (deerberry).

The herb layer of this association is characterized by patch-dominance of several low, ericaceous (heath-family) shrubs, particularly *Vaccinium stamineum*, *Vaccinium pallidum* (early lowbush blueberry), and to a lesser extent *Gaylussacia baccata* (black huckleberry). A number of xerophytic herbs occur frequently among these heaths, including *Agrostis perennans* (autumn bentgrass), *Antennaria plantaginifolia* (plantain-leaved Pussytoes), *Carex albicans* var. *australis* (bellow-beaked sedge), *Carex complanata* var. *hirsuta* (hirsute sedge), *Carex willdenowii* (Willdenow’s sedge), *Chimaphila maculata* (spotted wintergreen), *Comandra umbellata* (bastard-toadflax), *Cunila origanoides* (dittany), *Danthonia spicata* (poverty oat-grass), *Desmodium nudiflorum* (naked-flowered tick-trefoil), *Hieracium venosum* (rattlesnake-weed), *Houstonia purpurea* (large summer bluets), *Lysimachia quadrifolia* (whorled loosestrife), *Maianthemum racemosum* ssp. *racemosum* (false solomon’s-seal), and *Polygonatum biflorum* var. *biflorum* (solomon’s-seal). Mean species richness is 45 taxa per 400 m2.

**Distinguishing Features:** This community is distinguished by the strong overstory dominance of *Quercus alba* and the patch-dominance of the low ericaceous shrubs *Vaccinium stamineum*, *Vaccinium pallidum*, and *Gaylussacia baccata*. In some respects, this community is quite similar to the Basic Oak-Hickory Forest, but is somewhat drier and has less diverse shrub and herb layers that lack significant cover of nutrient-demanding species such as *Cercis canadensis* var. *canadensis* (eastern redbud), *Ostrya virginiana* (eastern hophornbeam), *Ulmus rubra* (slippery elm), *Muhlenbergia sobolifera* (cliff muhly), and *Elymus hystrix* var. *hystrix* (bottlebrush grass). This unit is apparently confined to soils weathered from siltstone, whereas the Basic Oak-Hickory Forest is largely (but not entirely) associated with soils weathered from diabase.

**Global Conservation Rank:**  G5?

**State Conservation Rank:**  S4S5

**Synonymy:** This vegetation has affinities to both SAF Cover Type 52: White Oak – Black Oak – Northern Red Oak and Cover Type 53: White Oak. The association is equivalent to USNVC CEGL008475: *Quercus alba - Quercus* (*rubra*, *coccinea*) - *Carya* (*alba*, *glabra*) / *Vaccinium pallidum* Piedmont Dry-Mesic Forest.

**Comments:** A recent analysis of more than 1300 Virginia and Maryland plots prepared for NatureServe and the National Park Service (DCR-DNH, unpublished data) indicated that this community type is widely distributed in the Virginia Piedmont on infertile soils weathered from intermediate metamorphic rocks, shale, slate, siltstone, phyllite, flaggy quartzite, and greenstone. It is probably the most abundant remaining upland forest community in the northern Virginia Culpeper Basin. The likely full range of the association is from Georgia north to the Piedmont and inner Coastal Plain of northern Virginia and adjacent Maryland.

All of the Park’s Acidic Oak-Hickory Forests have been cut in the past, and some appear to have been grazed. The dry, infertile soils occupied by this community tend to exclude most invasive exotic plants, although small populations of exotics were recorded in four of the seven plot samples. *Lonicera japonica* (Japanese honeysuckle) occurred in three plots and is potentially the most troublesome invasive in this community. Snags and dying trees of *Cornus florida* resulting from the fungal pathogen *Discula destructiva* (dogwood anthracnose) were present in all plots. In May of 2001, a localized outbreak of the exotic insect pest gypsy moth (Lymantria dispar) was present in the vicinity of plot MNBP30 on Henry Hill. Both gypsy moth and dogwood anthracnose represent serious threats to the compositional integrity and ecological health of oak forests in northern Virginia. See the Discussion section for more information.

**Representative Plots and Examples:**  MNBP09, MNBP13, MNBP20, MNBP21, MNBP23, MNBP26, MNBP30. Two of the best examples of this community in the Park are located just west of the field at Battery Heights and on the ridge just south of the Park Visitor Center on Henry Hill.

ECOLOGICAL COMMUNITY TYPE 3.2. – ACIDIC UPLAND FORESTS CLASS

***Pinus strobus – Quercus prinus* / *Kalmia latifolia* Forest**

Eastern White Pine – Chestnut Oak / Mountain-Laurel Forest

EASTERN WHITE PINE - HARDWOOD FOREST

**Habitat and Distribution:** This community type is known only from a small area on the west side of Bull Run, from approximately 0.7 to 1.2 km (0.4 to 0.7 mi) NW of US Rt. 29 and the Stone Bridge. The stand occupies both sub-level uplands and relatively steep slopes of a ravine system and bluff-top along the stream. The entire area is underlain by Ball’s Bluff siltstone and soils are extremely acidic and infertile. Most slopes occupied by this vegetation have northerly aspects and were subjectively considered submesic in site moisture potential. Surface substrate of most sampling sites consisted of thin leaf litter. The surficial soil horizon, below the leaf litter, consisted of 1 to 5 cm of dense root mats and humus. This community covers 6.72 ac (16.6 ha), or < 1% of the Park.

**Composition and Physiognomy:**

Constant Species (constancy ≥ 80%):

*Acer rubrum*, *Amelanchier arborea*, *Carya alba*, *Cornus florida*, *Euonymus americana*, *Fraxinus americana*, *Kalmia latifolia*, *Maianthemum racemosum* ssp. *racemosum*, *Nyssa sylvatica*, *Ostrya virginiana*, *Pinus strobus*, *Pinus virginiana*, *Polygonatum biflorum* var. *biflorum*, *Polystichum acrostichoides*, *Prunus serotina* var. *serotina*, *Quercus alba*, *Quercus prinus*, *Quercus rubra*, *Smilax rotundifolia*, *Tsuga canadensis*, *Vaccinium pallidum*, *Vaccinium stamineum*, *Viburnum acerifolium*.

Dominant Species (mean cover ≥ 6):

*Acer rubrum* (7), *Pinus strobus* (7), *Tsuga canadensis* (7), *Nyssa sylvatica* (6), *Quercus alba* (6), *Quercus prinus* (6), *Quercus rubra* (6).

Diagnostic Species (fidelity = 100% and mean cover > 1):

*Euonymus americana*, *Kalmia latifolia*, *Pinus strobus*, *Pteridium aquilinum* var. *latiusculum*, *Viola sagittata*.

Indicator Species (highest unscaled adj. IVs):

*Tsuga canadensis*, *Pinus strobus*, *Quercus prinus*, *Kalmia latifolia*, *Pteridium aquilinum* var. *latiusculum*, *Euonymus americana*, *Viburnum acerifolium*, *Polystichum acrostichoides*, *Viola sagittata*.

The vegetation of this unit is a mixed forest with overstory co-dominance by *Pinus strobus* (eastern white pine), *Quercus* spp. (oaks), and more locally, *Tsuga canadensis* (eastern hemlock). *Quercus prinus* (chestnut oak), *Quercus alba* (white oak), *Quercus rubra* (northern red oak), and *Quercus coccinea* (scarlet oak) are all present in the stand; of these, *Quercus prinus* can probably be considered most diagnostic since it is rare in other vegetation types of the Park. *Pinus virginiana* (Virginia pine) is an occasional overstory associate indicative of past disturbance. *Acer rubrum* (red maple) and *Nyssa sylvatica* (black gum) are the leading species of the understory, which also includes *Cornus florida* (flowering dogwood), *Sassafras albidum* (sassafras), *Carya alba* (mockernut hickory), and young reproduction of *Pinus strobus* and *Tsuga canadensis*. Ericaceous (heath-family) species, including *Kalmia latifolia* (mountain-laurel), *Gaylussacia baccata* (black huckleberry), *Vaccinium pallidum* (early lowbush blueberry), and *Vaccinium stamineum* (deerberry) are prevalent in the shrub and herb layers. True herbaceous plants are very sparse, and only *Pteridium aquilinum* var. *latiusculum* (northern bracken fern) and *Mitchella repens* (partridge-berry) attain local cover > 1%.

**Distinguishing Features:** The prominent evergreen aspect of this forest contributed by co-dominant *Pinus strobus*, *Tsuga canadensis*, and *Kalmia latifolia* is distinct among late-successional communities in MNBP.

**Global Conservation Rank:**  G4

**State Conservation Rank:**  S4?

**Synonymy:**  This vegetation can probably be considered a variant of SAF Cover Type 51: White Pine – Chestnut Oak. The association is equivalent to USNVC CEGL008539: *Pinus strobus - Quercus alba - Quercus coccinea* / *Vaccinium stamineum* Forest.

**Comments:** This dry, eastern white pine – oak community is most common on low mountains of the Ridge and Valley province in western Virginia and adjacent West Virginia, but is also widely scattered on the Blue Ridge and in the Piedmont. The stand at MNBP is variable and portions of it are transitional to an eastern hemlock community type. However, since *Pinus strobus* and oaks are important throughout, the entire occurrence is here treated and mapped as an eastern white pine – hardwood type. A stand dominated solely by hemlock and containing the regionally rare coniferous shrub *Taxus canadensis* (American yew), occurs on a north-facing bluff along Bull Run just outside the Park near Sudley.

During the field work for this project (2000-2001), the introduced Asiatic insect hemlock woolly adelgid (*Adelges tsugae*; Morisawa 2000) was present at relatively low levels in MNBP. Although this pest has devastated hemlock stands throughout Virginia during the past two decades, only limited damage was observed in the Park stand along Bull Run. Snags of *Cornus florida* resulting from the fungal pathogen *Discula destructiva* (dogwood anthracnose), as well as unexplained mortality of several oaks and Kalmia latifolia shrubs, were also recorded in the stand. Very old wood debris from *Castanea dentata* (American chestnut) was found along the top of the steep bluff subtending Bull Run and constitutes the only evidence of this species found in the Park.

**Representative Plots and Examples:**  MNBP18, MNBP19. The MNBP occurrence of this community type is considered significant by DCR-DNH ecologists.

ECOLOGICAL COMMUNITY TYPE 4.1. – MODIFIED / EARLY-SUCCESSIONAL UPLAND FORESTS CLASS

***Pinus virginiana – Juniperus virginiana* Forest**

Virginia Pine – Eastern Red Cedar Forest

VIRGINIA PINE – EASTERN RED CEDAR SUCCESSIONAL FOREST

**Habitat and Distribution:** This vegetation type is widespread in MNBP on former fields and clearings that were abandoned within the past 80 years. It covers 337.35 ha (834 ac), or 19% of the Park. Stands occupy low ridges and rolling to flat uplands (mean slope = 5º). Plot-sampling sites were subjectively considered submesic. Surface substrate at all sampling sites consisted of dense needle litter and 2 to 7% cover of decaying wood. Soils collected from plots were extremely to moderately clay loams and silty clay loams, sometimes with abundant channery. Regardless of parent material, soil samples had moderately low to very low base status.

**Composition and Physiognomy:**

Constant Species (constancy ≥ 80%):

*Cornus florida*, *Fraxinus americana*, *Lonicera japonica*, *Parthenocissus quinquefolia*, *Pinus virginiana*, *Prunus serotina* var. *serotina*, *Quercus velutina*, *Toxicodendron radicans*, *Vitis vulpina*.

Dominant Species (mean cover ≥ 6):

*Pinus virginiana* (8), *Cornus florida* (6), *Fraxinus americana* (6), *Juniperus virginiana* var. *virginiana* (6).

Diagnostic Species (fidelity = 100% and mean cover > 1):

*Botrychium dissectum*, *Galactia volubilis*, *Ilex opaca* var. *opaca*, *Quercus phellos*, *Taraxacum officinale*.

Indicator Species (highest unscaled adj. IVs):

*Pinus virginiana*, *Ilex opaca* var. *opaca*, *Botrychium dissectum*, *Galactia volubilis*, *Taraxacum officinale*, *Cornus florida*, *Prunus serotina* var. *serotina*, *Fraxinus americana*.

This forest community represents temporary, early-successional vegetation of abandoned fields. Although relatively short-persistent, this forest assemblage repeatedly develops on suitable habitats of the region. Because it recurs over the landscape in predictable association with specific environmental conditions, classification at an association level is warranted. Composition varies from nearly monospecific stands of *Pinus virginiana* (Virginia pine) or *Juniperus virginiana* var. *virginiana* (eastern red cedar), to mixed stands with these trees in varying proportions. *Cornus florida* (flowering dogwood) and hardwood regeneration, particularly of *Fraxinus americana* (white ash), *Acer rubrum* (red maple), *Carya* spp. (hickories), and *Quercus* spp. (oaks), are often abundant in the understory. The herb layer varies from about 10% total cover to nearly absent on sites densely shaded by overstocked pines or cedars.

**Community Subtypes:** Two fully intergrading, compositional subtypes can be recognized:

**4.1.1. *Pinus virginiana* / *Cornus florida* Subtype**

*Pinus virginiana* exclusively dominates the overstory, with abundant *Cornus florida* and young *Fraxinus americana* in the understory. *Juniperus virginiana* is sparse, or sometimes absent.

**4.1.2. *Juniperus virginiana – Pinus virginiana* Subtype**

*Juniperus virginiana* var. *virginiana* and *Pinus virginiana* co-dominate the overstory; or *Pinus virginiana* dominates the overstory and *Juniperus virginiana* var. *virginiana* dominates the understory; or *Juniperus virginiana* var. *virginiana* dominates exclusively, or nearly so. *Cornus florida* and *Fraxinus americana* are much less abundant and characteristic.

**Distinguishing Features:** The community type is instantly recognizable by its monospecific or mixed dominance of Virginia pine and eastern red cedar.

**Global Conservation Rank:** GD

**State Conservation Rank:**  SD

**Synonymy:**  This vegetation has affinities to SAF Cover Type 79: Virginia Pine and Cover Type 46: Eastern Red cedar. It is partly equivalent to USNVC CEGL002591: *Pinus virginiana* Successional Forest and partly equivalent to USNVC CEGL006024: Juniperus virginiana Forest.

**Comments:** This is the most abundant forest community in the Park, and is also characteristic of ruderal habitats throughout the northern Virginia Culpeper Basin. Exotic weeds, particularly *Lonicera japonica* (Japanese honeysuckle), occur frequently but with low cover in this type. Although evidence of infestations by the southern pine beetle (*Dendroctonus frontalis*) was not noted in the Park, Virginia pine stands in this region often suffer considerable mortality from periodic outbreaks of this tiny indigenous beetle.

*Pinus virginiana* is a short-lived, shade-intolerant tree that typically forms even-age forests. Once stands mature (~50 years), their demise is greatly hastened by the species’ susceptibility to wind-throw and breakage by ice and wind (Fowells 1965). A number of older Virginia pine stands in MNBP are highly decadent and nearing complete replacement, usually by one of the oak-hickory forest types. *Juniperus virginiana* var. *virginiana* is a much longer-lived, but still shade-intolerant tree. Red cedar-dominated forests are eventually overtopped, and eventually replaced, by taller hardwoods. In general, forests with only scattered, decadent pine or red cedar have been mapped as the appropriate hardwood type, and only those areas still occupied by clearly dominant pines or red cedars are mapped as the *Pinus virginiana – Juniperus virginiana* Forest.

**Representative Plots and Examples:**  This unit is represented by six rapid-assessment plot (RAP) samples:

Subtype 4.1 - MNBP01RAP, MNBP02RAP, MNBP04RAP, MNBP06RAP.

Subtype 4.2 – MNBP03RAP, MNBP05RAP