

Report on the
Vegetation of Stockport Forest, Wayne County,
Pennsylvania

prepared for the

Norcross Wildlife Foundation, Inc.

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by

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Site Description

Stockport Forest is a 1,937 acre property located in Buckingham Township, Wayne County, Pennsylvania. The tract includes frontage along the Delaware River, Route 191, and Stockport Road. Elevation varies from just under 900 feet at the river to 1662 feet above mean sea level at the highest point. Very steep slopes rise 400-500 feet from the Delaware River and the valley of Stockport Creek.

The site is entirely within the Hancock PA/NY USGS 7.5 minute quad. Two named streams traverse the site, Stockport Creek flows from just above the Beaver Pond to Route 191. Shingle Hollow Creek, with the exception of the headwaters of the right branch and the portion below Route 191, is entirely within the tract. South of Stockport Road the tract includes portions of tributaries of Stockport Creek and Nabbys Lake.

Bedrock geology is Devonian age Catskill Formation consisting of shales, siltstones, sandstone and conglomerate (DER 1980; Geyer and Wilshusen 1982). The surface is overlain by glacial deposits of the Wisconsinan Glaciation (Crowl and Sevon 1980).

More than half of the property lies north of Stockport Road and forms an unbroken block of forested land more than 1000 acres in extent, interrupted only by narrow woods roads and old quarries.

Evidence of past land use includes at least four abandoned bluestone quarries, each an acre or two in extent, numerous woods roads used for timber and stone removal, and a stone dam and dike on the Stockport Creek built in 1845. Other than the dam and another bridge across the Stockport Creek, there are no structures on the property. Timber harvesting has taken place fairly recently in some areas.

The property includes approximately 1 mile of Delaware River frontage consisting of steep slopes dropping down to the river from Route 191 in the northern portion of the eastern boundary.

Vegetation Survey

This survey was carried out by Drs. Ann F. Rhoads and Timothy A. Block of the Morris Arboretum of the University of Pennsylvania during three days of site visits in June and July 2000. Locations of endangered and threatened plants were recorded using a hand held GPS receiver CMT MC-GPS made by Corvallis Microtechnology, Corvallis, OR.

Upper Slopes and Ridges - The forest type on upper slopes and ridges consists of a dry oak - heath type (Fike 1999). The canopy is dominated by red oak (*Quercus rubra*), white oak (*Q. alba*), and red maple (*Acer rubrum*) with occasional chestnut oak (*Q. montana*) and chestnut (*Castanea dentata*). The understory contains mountain laurel (*Kalmia latifolia*), lowbush blueberry (*Vaccinium angustifolium* and *V. pallidum*), and black huckleberry (*Gaylussacia baccata*). On the ridge tops the shrub understory is dense and continuous, but lower down the slope the shrub layer has been severely impacted by deer browsing and is often reduced to a few suppressed shoots. Mountain laurel, because it is evergreen, is especially vulnerable to

browsing in the wintertime. Herbaceous species include bracken fern (*Pteridium aquilinum*), sarsaparilla (*Aralia nudicaulis*), common hairgrass (*Deschampsia flexuosa*), and cow-wheat (*Melampyrum lineare*).

Lower Slopes and Ravines - The lower slopes, north-facing slopes, and ravines are characterized by a hemlock-northern hardwood forest type (Fike 1999). Typical species include hemlock (*Tsuga canadensis*), American beech (*Fagus grandifolia*), yellow birch (*Betula allegheniensis*), sugar maple (*Acer saccharum*) with witch-hazel (*Hamamelis virginiana*) and occasionally striped maple (*Acer pensylvanica*) in the understory. In the steep ravine of Stockport Creek where access by deer is limited by the terrain, remnant populations of additional understory tree and shrub species can be found including mountain maple (*Acer spicatum*), rosebay rhododendron (*Rhododendron maximum*), hobblebush (*Viburnum lantanoides*), flowering raspberry (*Rubus odoratus*), bush-honeysuckle (*Diervilla lonicera*), red elderberry (*Sambucus pubens*), and round-leaved gooseberry (*Ribes rotundifolium*). In more accessible areas of gentler slopes the understory is almost exclusively heavily browsed beech shoots. Herbaceous species diversity is low except where the slopes are very steep or rocky or in wet areas along the streams. In many areas common wood-sorrel (*Oxalis acetosella*), hayscented fern (*Dennstaedtia punctilobula*), starflower (*Trientalis borealis*), and Canada mayflower (*Maianthemum canadense*) are the only herbaceous species present and much of the ground surface is bare. A more diverse herbaceous flora is present in the ravines and stream valleys, however, even in those more protected locations deer browse has reduced many species to small residual populations.

Transition Areas - A transition forest occurs between these two dominant types that is characterized by red maple, sugar maple, white oak, and beech. The understory in these mid-slope areas is very sparse with beech shoots and scattered American chestnut shoots that continue to sprout from old stumps. While seedlings of oaks and other tree species can be found, no sapling size trees are present, even where extensive tree harvesting has occurred. The seedlings present can be seen upon close inspection to have been browsed back repeatedly. Thickets of mountain laurel with only a few live shoots remaining are also evident. The herbaceous layer is dominated by sarsaparilla (*Aralia nudicaulis*) and hay-scented fern, species that are not highly preferred by deer. A sedge (*Carex debilis*), a grass (*Brachyelytrum erectum*) and occasional pink lady's-slipper (*Cypripedium acaule*) and round-leaved orchid (*Platanthera orbiculata*) can also be found among the dense ground-cover of sarsaparilla.

Headwaters Wetlands - Headwaters of tributaries of Stockport Creek and other creeks consist of hummocky expanses of wetland dominated by cinnamon fern (*Osmunda cinnamomea*), interrupted fern (*O. claytoniana*), and royal fern (*O. regalis*) surrounded by hemlock groves. Sphagnum moss hummocks bristling with sedges (*Carex bromoides*, *C. gynandra*, *C. prasina*, and *C. scoparia*) border the areas of springs and seeps that gradually coalesce to form small rivulets and eventually more pronounced stream channels. Other species found in these areas include goldthread (*Coptis trifoliata*), blue flag (*Iris versicolor*), bunchberry (*Cornus canadensis*), gaywings (*Polygala paucifolia*), and a few well chewed shrubs including mountain holly (*Ilex montana*), winterberry holly (*I. verticillata*) and spicebush (*Lindera benzoin*).

Quarries - Abandoned bluestone quarries constitute areas where the soil and rocks have been

excavated and disturbed. Piles of discarded rock fragments are present as well as excavations and exposed rock faces. Several of these old quarries appear to have been graded recently and are completely lacking plant cover. In others the natural process of revegetation has produced stands of trembling aspen (*Populus tremuloides*), gray birch (*Betula populifolia*), staghorn sumac (*Rhus typhina*) and the shrubs sweetfern (*Comptonia peregrina*), round-leaved gooseberry (*Ribes rotundifolium*), red raspberry (*Rubus idaeus*), black raspberry (*R. occidentalis*) and an occasional multiflora rose (*Rosa multiflora*). Native herbaceous species are also present including poverty grass (*Danthonia spicata*), deer tongue grass (*Panicum clandestinum*), several panic grasses (*Panicum dichotomum*, *P. linearifolium*), early goldenrod (*Solidago juncea*), whorled loosestrife (*Lysimachia quadrifolia*), and several non-native species including red and yellow clovers (*Trifolium pratense*, *T. aureum*), goat's-beard (*Tragopogon dubius*), common mullein (*Verbascum thapsus*), slender vetch (*Vicia tetrasperma*), English plantain (*Plantago lanceolata*) and oxeye daisy (*Chrysanthemum leucanthemum*).

Beaver Pond - The beaver pond is an impoundment on Stockport Creek above the manmade stone dam. The pond is surrounded by a 50-100 foot wide zone of shrubby growth perhaps representing an area where beaver consistently remove larger woody stems or perhaps a zone that was under water at some previous time, or both. The margin of the pond contains stands of emergent plants such as three-way sedge (*Dulichium arundinaceum*), arrowhead (*Sagittaria latifolia*), blue flag (*Iris versicolor*), soft rush (*Juncus effusus*), and the state endangered northern manna-grass (*Glyceria borealis*). Several patches of yellow pond lily (*Nuphar lutea*) and ribbonleaf pondweed (*Potamogeton epihydrus*) are also present in the pond.

The open area around the pond is dominated by gray birch (*Betula populifolia*), highbush blueberry (*Vaccinium corymbosum*), and meadow-sweet (*Spiraea latifolia*) which constitutes a highbush blueberry-meadow sweet wetland. In the wetter areas, especially at the west end where Stockport Creek enters the pond basin, there are thickets of northern arrowwood (*Viburnum recognitum*), pussy willow (*Salix discolor*), silky willow (*Salix sericea*), and winterberry holly, and large stands of several sedges (*Carex utriculata* and *C. scabrata*). Beaver are clearly active at the site.

Bank of the Delaware River - The Stockport Forest tract includes approximately 1 mile of riverbank at the base of a steep forested slope along Route 191. The slope is a continuation of the forested slopes on the west side of the road that rise steeply for 400-500 feet. The forest extends down the bank below the road to a narrow riverside ice-scour community (Fike 1999) adjacent to the river. Large boulders and rock outcrops are present along the lower edge. Near the northern end of the tract there is a section of riverbank about 175 feet long where water flowing out of the lower slope trickles down over the riverbank. These seeps provide habitat for the state endangered Chamisso's miners lettuce (*Montia chamissoi*) which grows with forget-me-not (*Myosotis scorpioides*), monkey flower (*Mimulus moschatus*), creeping buttercup (*Ranunculus repens*), bog chickweed (*Stellaria alsine*), and several mints (*Mentha x gentilis* and *M. x verticillata*).

Endangered Species - Two plants classified as species of special concern in Pennsylvania were

found during this survey; northern manna grass (*Glyceria borealis*), which grows in shallow water along the edge of the beaver pond, and Chamisso's miners lettuce (*Montia chamissoi*) which occurs along the riverbank are classified as endangered in Pennsylvania (DCNR 1993). Locations where these two species were found are shown in figure 1. Checkered rattlesnake plantain (*Goodyera tessellata*), which was found on the site in 1984, was not relocated, however it may well still exist somewhere on the property. This plant has been recommended for threatened status in the state.

Northern manna grass occurs from Newfoundland to Alaska and reaches its southern limit of range in New Jersey, Pennsylvania, Indiana, Iowa, and California (Fernald 1950, Gleason and Cronquist 1991). It is a perennial grass that grows in shallow water and wet shores of lakes, streams, and ponds. It is known from fewer than 20 locations in Pennsylvania, most of them in the northeastern counties of Wayne, Susquehanna, Pike, Lackawanna and Monroe (Rhoads and Block 2000; Rhoads and Klein 1993).

Chamisso's miners lettuce is one of the rarest plants in Pennsylvania (Wherry 1964, Rhoads et al. 1985). It occurs at several sites along the Upper Delaware River in Wayne County and at a single site in Minnesota but its main range lies in the western mountains from Alaska to California and Arizona (Fernald 1950, Gleason and Cronquist 1991; Rhoads and Klein 1993). The eastern plants are believed to represent relic populations from the glacial era. The plant, a member of the Portulaca Family, is a delicate perennial with opposite leaves, small 5-parted white or pinkish flowers and slender bulblet-bearing rhizomes (Rhoads and Block 2000). It grows on dripping sandstone ledges and seeps on the riverbank.

Checkered rattlesnake-plantain, is a native orchid known from fewer than 10 sites in northern Pennsylvania where it is at or near the southern limit of its range (Rhoads and Klein 1993). It grows in moist coniferous or deciduous forests from Newfoundland to eastern Manitoba and south to New York and northern Pennsylvania (Fernald 1950; Gleason and Cronquist 1991). Like other members of the genus, it is a perennial with distinctive evergreen leaves marked with light vein patterns.

Impacts

Timber harvest - Timber harvests conducted over the past 10-20 years appear to have removed most of the high quality timber with little regard for sustainability. This high grading has left the canopy in many areas dominated by red maple and beech. In some areas little or no regeneration is occurring and the understory contains little other than beech shoots.

Deer Overabundance - The diversity and future health of this forest are seriously threatened by excessive numbers of deer. The condition of the forest, including lack of tree regeneration, browsed shrubs, and depleted understory and ground layers clearly indicate that there are too many deer present. Canopy trees are not regenerating in many areas where the older trees were harvested. Diversity of species is greatly reduced, with steep areas in the ravine of Stockport Creek serving as a refugium where species such as hobblebush, mountain maple, and alternate-leaved dogwood that should be common throughout are barely maintaining a presence. Many wildflowers and other herbaceous species are similarly restricted.

Steep Slopes - Timber removal on steep slopes and creek banks has increased erosion on the site. There is evidence of three recent landslides on the north side of Stockport Creek. These are visible from Stockport Road.

Invasive Exotic Species - The Stockport Forest tract has not been seriously impacted by invasive exotic species, however there are initial incursions by several potentially serious weeds including multiflora rose which is scattered along the woods roads and in several of the quarries. Patches of Japanese knotweed (*Polygonum cuspidatum*) and purple loosestrife (*Lythrum salicaria*) along the riverbank could pose a serious threat to the Chamisso's miners lettuce.

Recommendations

Reduce Deer Density - Deer density should be reduced throughout the site in order to prevent further losses of biological diversity and allow the forest to regenerate. Deer density should be brought down to the point where forest understory and herbaceous layers can recover. In all probability suppressed fragments of many species would recover if the browsing pressure were reduced. But it will take many years for this site to recover the species and structural diversity that it should have throughout.

A new program recently adopted by the Pennsylvania Game Commission allows owners of tracts of 1000 acres or more to prepare a deer management plan for submission to the Game Commission, excess doe licenses will be made available for use on lands with an approved deer management plan. This program has just been adopted and will be initiated beginning in 2000 (see attached information).

Avoid Fragmentation - Stockport Forest represents a largely unbroken expanse of forest that should be protected from fragmentation so it can continue to provide habitat for area sensitive species of mammals and birds. It is important to maintain the continuous forested slopes along the Delaware River to continue to provide habitat for bald eagles that are moving south along the river. A pair has nested in the river valley just north of the tract for the past few years. Coyote, bear, and bobcat are also present in the area. Fragmentation also facilitates invasion by non-native exotic plants. If residences are to be located within the Stockport Forest property we strongly recommend that they be sited along Route 191 or Stockport Road or in other peripheral areas.

Protect Steep Slopes - Steep slopes along the Delaware River and Stockport Creek should be protected from deforestation to reduce erosion and maintain the hydrological basis for the riverbank seeps that provide habitat for Chamisso's miners lettuce.

Protect Headwaters Wetlands - Headwaters wetlands at the upper ends of tributary streams are important to maintaining steady flow in streams. These wetlands and adjacent areas should remain forested to preserve their hydrological function.

Control Exotic Invasive Plants - The scattered plants of multiflora rose that are present along woods roads and in several of the abandoned quarries should be removed as should the clumps of Japanese knotweed and purple loosestrife on the riverbank.

Revegetate Quarries - The old quarries should be allowed to revegetate with trembling aspen and other native species suited to the dry, open conditions. These naturally occurring early successional species will gradually be replaced by other forest species as the soil layer is rebuilt.

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Species Lists

(species marked with an asterisk are not native to Pennsylvania)

alternate-leaved dogwood	<i>Cornus alternifolia</i>
American ash	<i>Fraxinus americana</i>
American beech	<i>Fagus sylvatica</i>
arrowhead	<i>Sagittaria latifolia</i>
barren strawberry	<i>Waldsteinia fragarioides</i>
basswood	<i>Tilia americana</i>
bastard hellebore	<i>Epipactis helleborine*</i>
beaked hazelnut	<i>Corylus cornuta</i>
beggar-ticks	<i>Bidens connata</i>
bellwort	<i>Uvularia sessilifolia</i>
bird's-eye	<i>Veronica chamaedrys*</i>
bird's-eye	<i>Sagina procumbens</i>
bishop's-cap	<i>Mitella diphylla</i>
black huckleberry	<i>Gaylussacia baccata</i>
black oak	<i>Quercus velutina</i>
black raspberry	<i>Rubus occidentalis</i>
blackberry	<i>Rubus allegheniensis</i>
blackberry	<i>Rubus pensilvanicus</i>
blue flag	<i>Iris versicolor</i>
blue-eyed-grass	<i>Sisyrinchium angustifolium</i>
blue-eyed-grass	<i>Sisyrinchium montanum</i>
bluebead lily	<i>Clintonia borealis</i>
bluets	<i>Houstonia caerulea</i>
bog chickweed	<i>Stellaria alsine*</i>
boneset	<i>Eupatorium perfoliatum</i>
brachyelytrum	<i>Brachyelytrum erectum</i>
bracken fern	<i>Pteridium aquilinum</i>
broad-leaved plantain	<i>Plantago major*</i>
bulrush	<i>Scirpus georgianus</i>
bulrush	<i>Scirpus polyphyllus</i>
bunchberry	<i>Cornus canadensis</i>
bush-honeysuckle	<i>Diervilla lonicera</i>
Canada mayflower	<i>Maianthemum canadense</i>
Canada violet	<i>Viola canadensis</i>
chestnut	<i>Castanea dentata</i>
chestnut oak	<i>Quercus montana</i>
Christmas fern	<i>Polystichum acrostichoides</i>
cinnamon fern	<i>Osmunda cinnamomea</i>
cinquefoil	<i>Potentilla simplex</i>
cleavers	<i>Galium aparine</i>
coltsfoot	<i>Tussilago farfara*</i>
common hairgrass	<i>Deschampsia flexuosa</i>
common mullein	<i>Verbascum thapsus*</i>

common speedwell	<i>Veronica officinalis</i> *
common yellow wood-sorrel	<i>Oxalis stricta</i>
cow-wheat	<i>Melampyrum lineare</i>
creeping buttercup	<i>Ranunculus repens</i>
creeping spike-rush	<i>Eleocharis palustris</i>
daisy fleabane	<i>Erigeron strigosus</i>
dandelion	<i>Taraxacum officinale</i>
deer tongue grass	<i>Panicum clandestinum</i>
deerberry	<i>Vaccinium stamineum</i>
diamond willow	<i>Salix eriocephala</i>
dog violet	<i>Viola labradorica</i>
dogbane	<i>Apocynum cannabinum</i>
doll's-eyes	<i>Actaea pachypoda</i>
drooping bluegrass	<i>Poa languida</i>
dwarf ginseng	<i>Panax trifoliata</i>
dwarf raspberry	<i>Rubus pubescens</i>
dwarf St. John's-wort	<i>Hypericum boreale</i>
enchanter's nightshade	<i>Circaea alpina</i>
enchanter's-nightshade	<i>Circaea lutetiana</i>
English plantain	<i>Plantago lanceolata</i> *
evening-primrose	<i>Oenothera perennis</i>
evergreen wood fern	<i>Dryopteris intermedia</i>
false hellebore	<i>Veratrum viride</i>
false Solomon's-seal	<i>Smilacina racemosa</i>
feverfew	<i>Chrysanthemum parthenium</i> *
field horsetail	<i>Equisetum arvense</i>
flat-branched ground-pine	<i>Lycopodium obscurum</i>
fly-honeysuckle	<i>Lonicera canadensis</i>
foamflower	<i>Tiarella cordifolia</i>
forget-me-not	<i>Myosotis scorpioides</i> *
fowl mannagrass	<i>Glyceria striata</i>
fragile fern	<i>Cystopteris fragilis</i>
fringed bindweed	<i>Polygonum cilinode</i>
fringed loosestrife	<i>Lysimachia ciliata</i>
gaywings	<i>Polygala paucifolia</i>
goat's-beard	<i>Tragopogon dubius</i> *
golden saxifrage	<i>Chrysosplenium americanum</i>
goldthread	<i>Coptis trifoliata</i>
gray birch	<i>Betula populifolia</i>
hardhack	<i>Spiraea tomentosa</i>
hawthorn	<i>Crataegus</i> sp.
hayscented fern	<i>Dennsteadtia punctilobula</i>
heal-all	<i>Prunella vulgaris</i> *
hemlock	<i>Tsuga canadensis</i>
hickory	<i>Carya</i> (seedlings)

hobblebush	<i>Viburnum lantanoides</i>
hog-peanut	<i>Amphicarpa bracteata</i>
hooked crowfoot	<i>Ranunculus recurvatus</i>
horse-balm	<i>Collinsonia canadensis</i>
hybrid oak	<i>Quercus saulii</i>
Indian cucumber-root	<i>Medeola virginiana</i>
Indian pipes	<i>Monotropa uniflora</i>
interrupted fern	<i>Osmunda claytoniana</i>
ironwood	<i>Carpinus caroliniana</i>
jack-in-the-pulpit	<i>Arisaema triphyllum</i>
Japanese knotweed	<i>Polygonum cuspidatum*</i>
jewelweed	<i>Impatiens capensis</i>
Juneberry	<i>Amelanchier arborea</i>
Kentucky bluegrass	<i>Poa pratensis*</i>
lady fern	<i>Athyrium filix-femina</i>
large yellow hop-clover	<i>Trifolium aureum*</i>
late goldenrod	<i>Solidago altissima</i>
leatherwood	<i>Dirca palustris</i>
long-leaved stitchwort	<i>Stellaria longifolia</i>
low cudweed	<i>Gnaphalium uliginosum</i>
low smartweed	<i>Polygonum caespitosum*</i>
lowbush blueberry	<i>Vaccinium angustifolium</i>
lowbush blueberry	<i>Vaccinium pallidum</i>
maidenhair fern	<i>Adiantum pedatum</i>
maidenhair spleenwort	<i>Asplenium trichomanes</i>
maple-leaved viburnum	<i>Viburnum acerifolium</i>
marsh bedstraw	<i>Galium obtusum</i>
marsh pennywort	<i>Hydrocotyle americana</i>
meadow-sweet	<i>Spiraea latifolia</i>
mint	<i>Mentha x verticillata*</i>
mountain holly	<i>Ilex montana</i>
mountain laurel	<i>Kalmia latifolia</i>
mountain maple	<i>Acer spicatum</i>
mouse-ear hawkweed	<i>Hieracium pilosella*</i>
muskflower	<i>Mimulus moschatus*</i>
New York fern	<i>Thelypteris noveboracensis</i>
nodding fescue	<i>Festuca obtusa</i>
northern arrow-wood	<i>Viburnum recognitum</i>
northern beech fern	<i>Phegopteris connectilis</i>
northern manna grass	<i>Glyceria borealis</i>
northern wood-sorrel	<i>Oxalis acetosella</i>
oak fern	<i>Gymnocarpium dryopteris</i>
old-pasture grass	<i>Poa saltuensis</i>
orange hawkweed	<i>Hieracium aurantiacum*</i>
oxeye daisy	<i>Chrysanthemum leucanthemum*</i>

painted trillium	<i>Trillium undulatum</i>
panic grass	<i>Panicum latifolium</i>
panic grass	<i>Panicum dichotomum</i>
panic-grass	<i>Panicum linearifolium</i>
partridge berry	<i>Mitchella repens</i>
path rush	<i>Juncus tenuis</i>
pearly everlasting	<i>Anaphalis margaritacea</i>
Pennsylvania bittercress	<i>Cardamine pennsylvanica</i>
pignut hickory	<i>Carya glabra</i>
pink lady's-slipper	<i>Cypripedium acaule</i>
pinxter-flower	<i>Rhododendron periclymenoides</i>
poison ivy	<i>Toxicodendron radicans</i>
poverty grass	<i>Danthonia spicata</i>
purple flowering raspberry	<i>Rubus odoratus</i>
purple loosestrife	<i>Lythrum salicaria*</i>
purple trillium	<i>Trillium erectum</i>
pussy willow	<i>Salix discolor</i>
rattlesnake fern	<i>Botrychium virginianum</i>
rattlesnake root	<i>Prenanthes sp.</i>
red clover	<i>Trifolium pratense*</i>
red elderberry	<i>Sambucus racemosa var. pubens</i>
red maple	<i>Acer rubrum</i>
red mint	<i>Mentha x gentilis*</i>
red oak	<i>Quercus rubra</i>
red raspberry	<i>Rubus idaeus</i>
reed canary grass	<i>Phalaris arundinacea</i>
Rhode Island bent	<i>Agrostis capillaris</i>
ribbonleaf pondweed	<i>Potamogeton epihydrus</i>
rock-cap fern	<i>Polypodium virginianum</i>
rose mandarin	<i>Streptopus rosea var. perspectus</i>
rosebay rhododendron	<i>Rhododendron maximum</i>
rough bluegrass	<i>Poa trivialis*</i>
round-leaved gooseberry	<i>Ribes rotundifolium</i>
round-leaved hepatica	<i>Hepatica nobilis var. obtusifolia</i>
round-leaved orchid	<i>Platanthera orbiculata</i>
round-leaved violet	<i>Viola rotundifolia</i>
royal fern	<i>Osmunda regalis</i>
running pine	<i>Lycopodium clavatum</i>
ryegrass	<i>Lolium sp.</i>
sarsaparilla	<i>Aralia nudicaulis</i>
sedge	<i>Carex arctata</i>
sedge	<i>Carex appalachica</i>
sedge	<i>Carex bromoides</i>
sedge	<i>Carex communis</i>
sedge	<i>Carex debilis var. rudgei</i>

sedge	<i>Carex deweyana</i>
sedge	<i>Carex digitalis</i>
sedge	<i>Carex echinata</i>
sedge	<i>Carex glaucoidea</i>
sedge	<i>Carex gracillima</i>
sedge	<i>Carex gynandra</i>
sedge	<i>Carex intumescens</i>
sedge	<i>Carex laxiculmis</i>
sedge	<i>Carex laxiflora</i>
sedge	<i>Carex lurida</i>
sedge	<i>Carex normalis</i>
sedge	<i>Carex prasina</i>
sedge	<i>Carex radiata</i>
sedge	<i>Carex scabrata</i>
sedge	<i>Carex scoparia</i>
sedge	<i>Carex stipata</i>
sedge	<i>Carex straminea</i>
sedge	<i>Carex swanii</i>
sedge	<i>Carex trisperma</i>
sedge	<i>Carex utriculata</i>
sensitive fern	<i>Onoclea sensibilis</i>
shagbark hickory	<i>Carya ovata</i>
sharp-fruited rush	<i>Juncus acuminatus</i>
shinleaf	<i>Pyrola elliptica</i>
silky willow	<i>Salix sericea</i>
silvery cinquefoil	<i>Potentilla argentea*</i>
silvery glade fern	<i>Deparia acrostichoides</i>
slender vetch	<i>Vicia tetrasperma*</i>
small-flowered crowfoot	<i>Ranunculus abortivus</i>
smooth goldenrod	<i>Solidago gigantea</i>
soft rush	<i>Juncus effusus</i>
Solomon's-seal	<i>Polygonatum pubescens</i>
spicebush	<i>Lindera benzoin</i>
spikenard	<i>Aralia racemosa</i>
staghorn sumac	<i>Rhus typhina</i>
starflower	<i>Trientalis borealis</i>
striped maple	<i>Acer pensylvanicum</i>
sugar maple	<i>Acer saccharum</i>
sulfur cinquefoil	<i>Potentilla recta*</i>
swamp candles	<i>Lysimachia terrestris</i>
swamp dewberry	<i>Rubus hispidus</i>
sweet vernal grass	<i>Anthoxanthum odoratum*</i>
sweet-cicely	<i>Osmorhiza claytonii</i>
sweet-fern	<i>Comptonia peregrina</i>
tall meadow-rue	<i>Thalictrum pubescens</i>

teaberry	<i>Gaultheria procumbens</i>
three-way sedge	<i>Dulichium arundinaceum</i>
toad rush	<i>Juncus bufonius</i>
trembling aspen	<i>Populus tremuloides</i>
tuliptree	<i>Liriodendron tulipifera</i>
turtlehead	<i>Chelone glabra</i>
two-leaved toothwort	<i>Cardamine diphylla</i>
virgin's bower	<i>Clematis</i> sp.
water speedwell	<i>Veronica anagallis-aquatica</i>
watercress	<i>Nasturtium officinale</i> *
white oak	<i>Quercus alba</i>
white pine	<i>Pinus strobus</i>
white snakeroot	<i>Eupatorium rugosum</i>
white wood aster	<i>Aster divaricatus</i>
whorled loosestrife	<i>Lysimachia quadrifolia</i>
wild basil	<i>Clinopodium vulgare</i> *
wild black cherry	<i>Prunus serotina</i>
wild ginger	<i>Asarum canadense</i>
wild strawberry	<i>Fragaria virginica</i>
winterberry holly	<i>Ilex verticillata</i>
witch-hazel	<i>Hamamelis virginiana</i>
wood anemone	<i>Anemone quinquefolia</i>
wood aster	<i>Aster acuminatus</i>
wood geranium	<i>Geranium maculatum</i>
wood nettle	<i>Laportea canadensis</i>
wood-rush	<i>Luzula multiflora</i>
woodland bluegrass	<i>Poa alsodes</i>
woodland horsetail	<i>Equisetum sylvaticum</i>
wrinkle-leaf goldenrod	<i>Solidago rugosa</i>
yellow birch	<i>Betula allegheniensis</i>
yellow pond lily	<i>Nuphar lutea</i>
zigzag goldenrod	<i>Solidago flexicaulis</i>