

Report on a Site Visit to the Wayne Cave Addition

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Wayne Cave Preserve is an approximately 57-acre preserve in western Monroe County that contains an entrance to Wayne Cave, the 7th longest cave in Indiana at over 5 miles of surveyed passage. It lies near the edge of the Mitchell Karst Plain subregion of the Highland Rim Natural Region and the Escarpment Section subregion of the Shawnee Hills Natural Region. The ridgetops are capped with sandstone while the karst features manifest mid-slope or lower into the valleys where limestone bedrock is present. The site was not identified in DNP's Potential Natural Area program, nor registered as a natural area, but is identified as a conservation site in the Natural Heritage Database along with the nearby Buckner, Coon's, Grotto, Salamander, and Saltpeter Caves. At present, the entrances to Wayne and Buckner Caves are owned by the Indiana Karst Conservancy (IKC) and National Speleological Society, respectively. All others are privately owned and, with the exception of Saltpeter Cave, have USFWS/INDOT conservation easements for bat hibernacula.

The earliest records from this location are the PLSS surveyor notes. The eastern boundary of T8N R2W Section 17 is the eastern boundary of the Wayne Preserve. The one-mile transect is described as "land rich and timber same as in the last mile (Sugar, Beech, and Poplar)." In spite of this characterization of the forest, most of the witness trees at the four corners of the section are white oaks, hickories, and a black walnut, all around 15 inches in diameter at breast height. William Wayne's (the cave's namesake) 1950 paper titled "A Karst Valley in Western Monroe County, Indiana" describes the Garrison Chapel karst region focusing largely on the bedrock and topography of the area. In 2008, DNR Division of Nature Preserves funded Dr. Julian Lewis to conduct a bioinventory of Wayne Cave in addition to the other Garrison Chapel area caves. The 2016 IKC Update contains a chronology of Wayne Cave compiled by Tom Sollman which recounts the various mapping expeditions of the cave. This report addresses the plants and plant communities of IKC's Wayne Cave Preserve as well as Keith Dunlap's Wayne Cave Addition at the request of Nature Preserves Director Ron Hellmich.

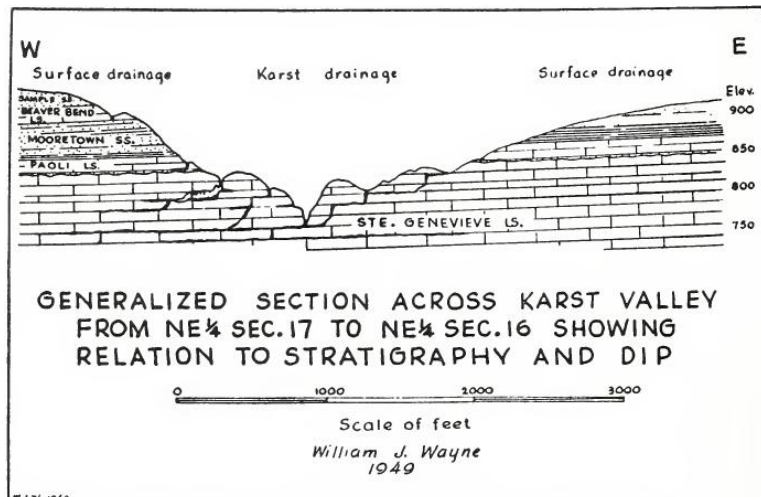


Diagram from Wayne's 1950 publication

We visited the site on May 16, 2023 and the group consisted of IKC board member and Wayne Cave Addition owner Keith Dunlap, Central Region Ecologist Danielle Williams, and Community Ecologist Wyatt Williams. Volunteer property manager Danyele Green planned to

join but had to cancel. We followed the IKC's trail through their property and kept a plant list of things visible along the trail. We took brief detours from the trail to see various cave openings and follow small drainages to add to the species list but prioritized getting to the sinkhole swamp and the addition. The trail went through mesic upland forest that was mostly high quality and was dotted with karst features that housed conservative plants like *Hydrangea arborescens*, *Carex communis*, and other species associated with rock outcrops. Intensive invasive species removal is happening throughout the property with funding from an EQIP grant and labor from volunteers. Keith told us that some of the highest quality areas we were observing used to have the highest



One of many rock outcroppings on the IKC property

density of invasive species – the work seemed to be very thorough and selective with only scattered small stems of *Rosa multiflora* observed through the forested parts of the IKC preserve. Aside from the rich mesic upland forest that dominates most of the IKC preserve, there are deep sinkholes covered in ferns, dry-mesic slopes with oaks and hickories, and some weedier spots like an old pasture and the mowed parking area. These spots were quickly noted on our walk out of the property and didn't receive the same attention the sinkhole swamp and Wayne Cave Addition received, in part because Nic Garza, funded by a grant from the Indiana Land Preservation Alliance and Indiana Academy of Science, is conducting a plot sampling study of the succession of the old pasture.

The highlight of IKC's Wayne Cave property is a portion of a sinkhole swamp, recognized as a globally imperiled plant community by NatureServe. The other portion of the swamp is in Keith's Addition. We took notes on the dominant plants and made a few collections for identification which will be housed in the Deam Herbarium at IU. The community survey form is included at the end of this report. The structure and composition of the swamp are optimal with no single plant dominating the community. On the mucky margin of the swamp where water had dried down,



Zone of sinkhole swamp with *Carex crinita*



View of sinkhole swamp from uphill on Keith's property. The closest half of the swamp is on the Addition.

Alisma subcordatum, *Lycopus* cf. *rubellus*, and *Triadenum* cf. *walteri* seem to thrive. The western portion of the swamp had numerous senesced stems of *Decodon verticillatus* with small green stems emerging within a dense region of sedges. Further into the swamp where the water was deeper, large showy ferns and sedges dominated, namely *Osmunda spectabilis* and *Carex crinita*. Near the center of the swamp and through portions of the previous zone, *Carex decomposita*, listed in every state in which it occurs and threatened in Indiana, formed floating hummocks where *Cicuta maculata* and *Impatiens capensis* were growing. Scattered throughout the swamp were small areas of open water with *Lemna* floating as scattered individuals.

A majority of Keith's Wayne Cave Addition is a very unique mesic upland forest. The canopy is largely dominated by *Acer saccharum* and *Fagus grandifolia* in spite of being relatively steep, south-facing, rocky slopes. The canopy is dense and the valley is noticeably cooler and more shaded than much of the IKC Preserve. The geology of the Addition matches that of the IKC property with sandstone capped ridges and upper slopes grading into limestone ravines dotted with karst features. One of the most noteworthy elements was the rich diversity and abundance of *Carex* sedges. We timed the visit out to get a sense of the spring wildflower display but received a display of sedges on and around limestone and sandstone outcrops! Keith says the owner had pastured the east half of the Addition but not the west, but we didn't see a noticeable difference in quality. Invasive species pressure within the wooded slopes is minimal to absent

with Keith treating the scattered stems of *Rosa multiflora*. We witnessed one canopy gap with a small flush of *Microstegium vimineum*, but most invasives are restricted to an old access lane and home site.



Typical view of the forest in Keith's Addition. Note the unique topography with a terrace following the contour of the slope. While not visible in this photo, many outcroppings were present on the hillsides.

The sinkhole swamp is the most important part of the plant communities within the IKC property and Keith's Addition. It is the only sinkhole swamp known in Monroe County, and only one of nine known from the state. Of those nine, all are on private land except part of this one and one other – the protected one has no rare plants and is of lower quality than this. Aside from the sinkhole swamp, perhaps the most important thing the Addition accomplishes is connectivity of remnant natural areas. It connects the two cave properties, protects additional cave and sinkhole openings, and continues to allow the sites to have mobility of wildlife between them. In Monroe County, with Bloomington ever-growing and expanding, this is a significant accomplishment. Properties directly adjacent to the west and beyond, most owned by Pike Lumber Company, include forested ridges and valleys within this Garrison Chapel karst region and should be the target of further conservation efforts.

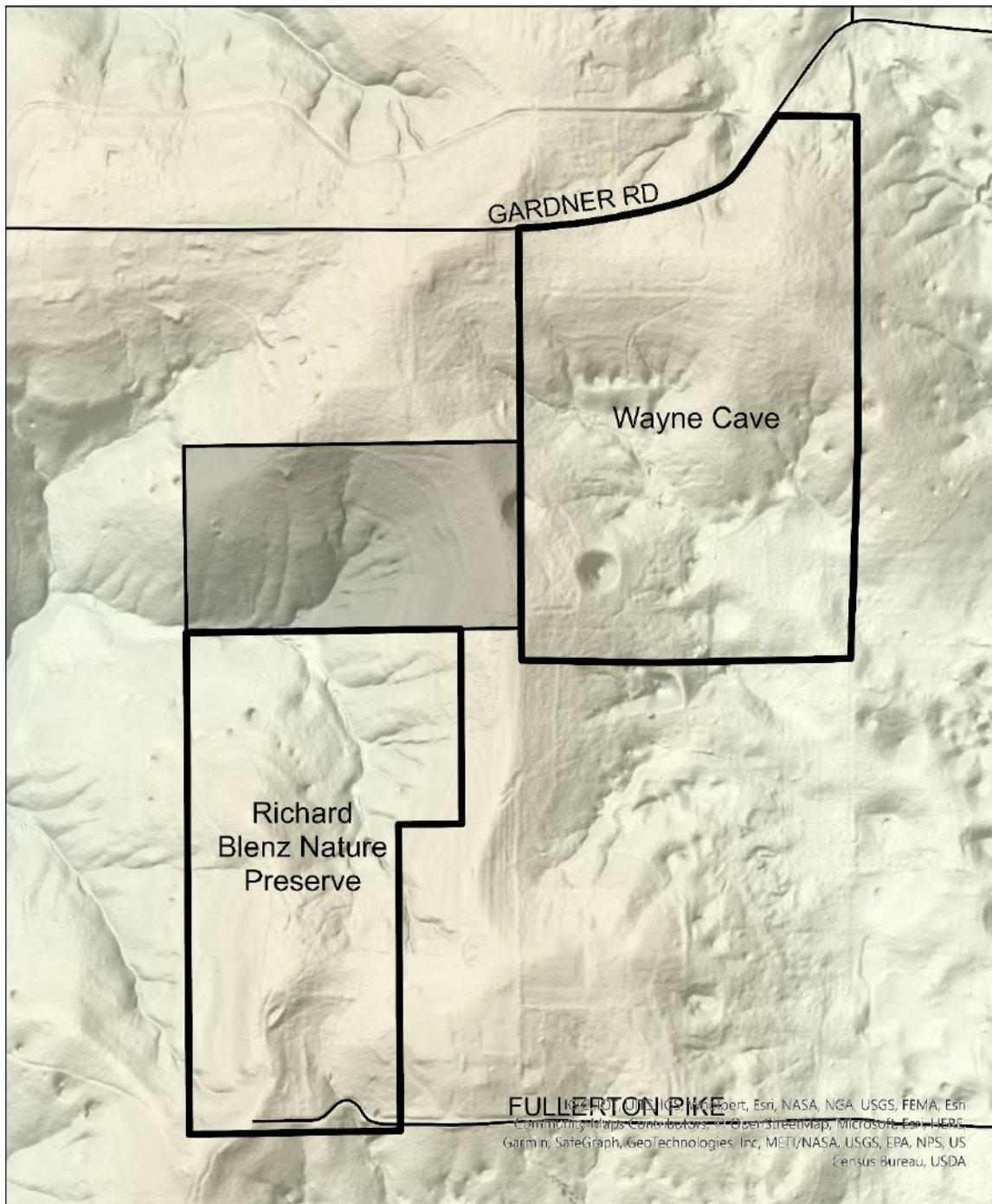


Figure 1. Map of Keith Dunlap’s Wayne Cave Addition (shaded). The deep sinkhole bisected by the property line is the sinkhole swamp community; the one to the southeast of the swamp is a deep, fern-covered sinkhole that does not hold water.

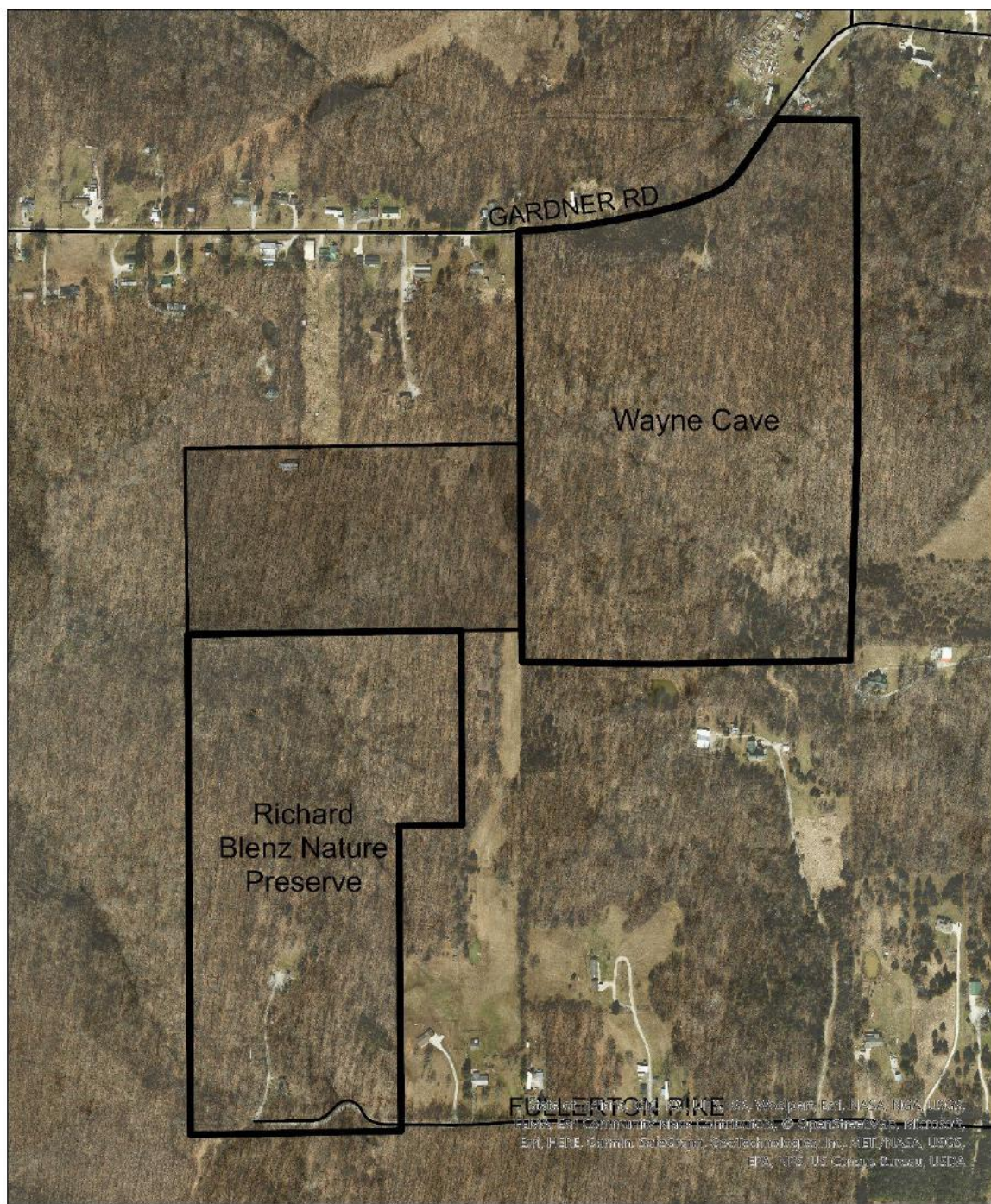


Figure 2. Same map as above with satellite imagery. The house in the northern part of Keith's Addition has since been removed. Note the sinkhole swamp is visible in the imagery and that comparable habitat continues east into Greene County.

Indiana Natural Community Survey Form (updated 2/2022)

Element Name: _____

Surveyor (s): _____ Date: _____

County: _____ UTM/GPS coordinates: _____

Repeat visit: _____ If yes, EO # _____ Repeat visit needed: _____ When: _____

Entire Natural Community assessed? No Yes If no, estimated extent covered (%) _____

EO boundaries mapped: No Yes: Show exact location and boundaries on map or digital file

Area name (if applicable) _____

Owner info (if known) _____

Biology

Stratal Dominant Species (include % cover tree [T], shrub [S], woody vine [W], and herbaceous [H] if possible)

Species	T	S	W	H

Other Species of Note:

Invasive Species (include % cover tree [T], shrub [S], woody vine [W], and herbaceous [H] if possible)

Species	T	S	W	H

State or Federal Listed Taxa:

% Bare Ground: _____ Were cover values determined: ___ visually? ___ quantitatively?

Species list attached: Yes No

General description and comments (such as estimated average or exceptional tree DBH, invasive cover abundance, zonation, structural quality, general overall quality, etc.):

Natural Community Survey Form – page 2 (updated 2/2022)

Physical Description

Size: _____ Substrate/Soils: _____

Aspect

- N
- E
- S
- W

Slope

- Flat
- 0-10°
- 10-35°
- 35°+
- Vertical

Topographic Position

- Crest
- Upper Slope
- Mid Slope
- Lower Slope
- Bottom

Moisture

- Wet
- Wet-mesic
- Mesic
- Dry-mesic
- Dry

Surface Relief: / ~ ^ — ~~~

Conservation

Threat/Disturbance

Past Current Notes/Evidence

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Surrounding land use:

EO rank (choose one from below, or a range): _____

- A (excellent)
- B (good)
- C (fair)
- D (poor)
- E (extant)
- X (extirpated)

Additional Comments:

Wayne Cave and Keith Dunlap's Addition
 Location: Monroe County, Indiana
 W. Williams, D. Williams, & K. Dunlap
 Date: 5/19/2023

Conservatism-Based Metrics:		
Total Mean C:	3.9	
Native Mean C:	4.4	
Total FQI:	51	
Native FQI:	54.1	
Adjusted FQI:	41.3	
% C value 0:	15.2	
% C value 1-3:	26.9	
% C value 4-6:	38	
% C value 7-10:	19.9	
Native Tree Mean C:	4.1	
Native Shrub Mean C:	4.4	
Native Herbaceous Mean C:	4.5	
Species Richness:		
Total Species:	171	
Native Species:	151	88.30%
Non-native Species:	20	11.70%
Species Wetness:		
Mean Wetness:	1.6	
Native Mean Wetness:	1.4	
Physiognomy Metrics:		
Tree:	25	14.60%
Shrub:	16	9.40%
Vine:	9	5.30%
Forb:	80	46.80%
Grass:	10	5.80%
Sedge:	20	11.70%
Rush:	1	0.60%
Fern:	10	5.80%
Bryophyte:	0	0%
Duration Metrics:		
Annual:	12	7%
Perennial:	154	90.10%
Biennial:	5	2.90%
Native Annual:	8	4.70%
Native Perennial:	141	82.50%
Native Biennial:	2	1.20%

Notes:

- 1) Present but not identifiable to species: *Agrimonia* sp., *Eutrochium* sp., *Nabalus* sp., *Pycnanthemum* sp., *Rubus* sp. (Possibly *R. enslenii* or *R. flagellaris*), *Triadenum* cf. *walteri*, *Vitis* sp. (*V. aestivalis* or *V. cinerea*)
- 2) *Calycanthus floridus* entered as *Forsythia suspensus*, *Melilotus albus* entered as *M. officinalis*
- 3) Conservatism-Based metrics from UniversalFQA's Indiana, 2019 Database

Species:

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name	Status
<i>Acer rubrum</i>	Sapindaceae	ACERUB	native	5	0	tree	perennial	red maple	
<i>Acer saccharum</i>	Sapindaceae	ACESAR	native	4	3	tree	perennial	sugar maple	
<i>Achillea millefolium</i>	Asteraceae	ACHMIL	native	0	3	forb	perennial	common milfoil	
<i>Actaea pachypoda</i>	Ranunculaceae	ACTPAC	native	7	3	forb	perennial	dolls-eyes	
<i>Ageratina altissima</i> var. <i>altissima</i>	Asteraceae	AGEALT	native	2	3	forb	perennial	white snakeroot	
<i>Agrimonia</i> sp.	Rosaceae	AGRSP	native	NA	NA	forb	perennial	agrimony	
<i>Alisma subcordatum</i>	Alismataceae	ALISUB	native	2	-5	forb	perennial	common water plantain	
<i>Alliaria petiolata</i>	Brassicaceae	ALLPET	non-native	0	0	forb	biennial	garlic mustard	
<i>Ambrosia artemisiifolia</i>	Asteraceae	AMBART	native	0	3	forb	annual	common ragweed	
<i>Ambrosia trifida</i>	Asteraceae	AMBTRI	native	0	0	forb	annual	giant ragweed	
<i>Amphicarpaea bracteata</i>	Fabaceae	AMPBRA	native	5	0	vine	annual	hog-peanut	
<i>Apocynum cannabinum</i>	Apocynaceae	APOCAN	native	2	0	forb	perennial	dogbane	
<i>Arisaema triphyllum</i>	Araceae	ARITRI	native	4	-3	forb	perennial	indian turnip	
<i>Asarum canadense</i>	Aristolochiaceae	ASACAN	native	5	3	forb	perennial	canada wild ginger	
<i>Asclepias quadrifolia</i>	Apocynaceae	ASCQUA	native	8	3	forb	perennial	whorled milkweed	
<i>Asimina triloba</i>	Annonaceae	ASITRI	native	6	0	tree	perennial	pawpaw	
<i>Asplenium platyneuron</i>	Aspleniaceae	ASPPLA	native	3	3	fern	perennial	ebony spleenwort	
<i>Barbarea vulgaris</i>	Brassicaceae	BARVUL	non-native	0	0	forb	biennial	yellow rocket	
<i>Borodinia laevigata</i>	Brassicaceae	BORLAE	native	5	5	forb	biennial	smooth rock cress	
<i>Botrypus virginianus</i>	Ophioglossaceae	BOTVIR	native	4	3	fern	perennial	rattlesnake fern	
<i>Brachyelytrum erectum</i>	Poaceae	BRAERE	native	6	3	grass	perennial	long-awned wood grass	
<i>Calycanthus floridus</i>	Calycanthaceae	CALFLO	non-native	0	5	shrub	perennial	carolina allspice	
<i>Cardamine concatenata</i>	Brassicaceae	CARCON	native	4	3	forb	perennial	toothwort	
<i>Cardamine hirsuta</i>	Brassicaceae	CARHIR	non-native	0	3	forb	annual	hairy bitter cress	
<i>Cardamine parviflora</i>	Brassicaceae	CARPAR	native	2	0	forb	annual	small-flowered bitter cress	
<i>Carex albicans</i> var. <i>albicans</i>	Cyperaceae	CXALBA	native	6	5	sedge	perennial	blunt-scaled oak sedge	
<i>Carex albursina</i>	Cyperaceae	CXALBU	native	7	5	sedge	perennial	blunt-scaled wood sedge	
<i>Carex amphibola</i>	Cyperaceae	CXAMPH	native	8	0	sedge	perennial	false gray sedge	
<i>Carex blanda</i>	Cyperaceae	CXBLAN	native	1	0	sedge	perennial	common wood sedge	
<i>Carex careyana</i>	Cyperaceae	CXCARE	native	9	5	sedge	perennial	careys wood sedge	
<i>Carex communis</i> var. <i>communis</i>	Cyperaceae	CXCOMM	native	8	5	sedge	perennial	common beech sedge	
<i>Carex crinita</i> var. <i>crinita</i>	Cyperaceae	CXCRIN	native	8	-5	sedge	perennial	fringed sedge	
<i>Carex decomposita</i>	Cyperaceae	CXDECO	native	10	-5	sedge	perennial	broad-leaved panicled sedge	Threatened
<i>Carex glaucoidea</i>	Cyperaceae	CXGLAU	native	3	0	sedge	perennial	blue sedge	
<i>Carex grisea</i>	Cyperaceae	CXGRIS	native	3	0	sedge	perennial	common gray sedge	
<i>Carex hirsutella</i>	Cyperaceae	CXHIRS	native	3	3	sedge	perennial	hairy green sedge	
<i>Carex hirtifolia</i>	Cyperaceae	CXHIRT	native	5	3	sedge	perennial	hairy wood sedge	
<i>Carex jamesii</i>	Cyperaceae	CXJAME	native	4	5	sedge	perennial	grass sedge	
<i>Carex laxiculmis</i> var. <i>laxiculmis</i>	Cyperaceae	CXLAXL	native	7	3	sedge	perennial	weak-stemmed wood sedge	
<i>Carex laxiflora</i>	Cyperaceae	CXLAXF	native	7	5	sedge	perennial	beech wood sedge	
<i>Carex lurida</i>	Cyperaceae	CXLURI	native	4	-5	sedge	perennial	bottlebrush sedge	
<i>Carex platyphylla</i>	Cyperaceae	CXPLAT	native	10	5	sedge	perennial	broad-leaved wood sedge	
<i>Carex radiata</i>	Cyperaceae	CXRADI	native	4	0	sedge	perennial	straight-styled bracted sedge	
<i>Carex stipata</i> var. <i>stipata</i>	Cyperaceae	CXSTIS	native	2	-5	sedge	perennial	common fox sedge	
<i>Carex willdenowii</i>	Cyperaceae	CXWILL	native	8	3	sedge	perennial	willdenows grass sedge	
<i>Carpinus caroliniana</i> subsp. <i>virginiana</i>	Betulaceae	CARCAR	native	5	0	tree	perennial	blue beech	
<i>Carya glabra</i>	Juglandaceae	CARGLA	native	4	3	tree	perennial	pignut hickory	

<i>Carya ovalis</i>	Juglandaceae	CAROVL	native	5	5	tree	perennial	red hickory	
<i>Carya ovata</i>	Juglandaceae	CAROVA	native	4	3	tree	perennial	shagbark hickory	
<i>Caulophyllum thalictroides</i>	Berberidaceae	CAUTHA	native	8	5	forb	perennial	blue cohosh	
<i>Cercis canadensis</i> var. <i>canadensis</i>	Fabaceae	CERCAN	native	3	3	tree	perennial	eastern redbud	
<i>Cicuta maculata</i>	Apiaceae	CICMAC	native	6	-5	forb	biennial	common water hemlock	
<i>Cirsium altissimum</i>	Asteraceae	CIRALT	native	4	5	forb	perennial	tall thistle	
<i>Claytonia virginica</i>	Montiaceae	CLAVIR	native	2	3	forb	perennial	spring beauty	
<i>Collinsonia canadensis</i>	Lamiaceae	COLCAN	native	8	0	forb	perennial	citronella horse balm	
<i>Cornus florida</i>	Cornaceae	CORFLO	native	4	3	tree	perennial	flowering dogwood	
<i>Cryptotaenia canadensis</i>	Apiaceae	CRYCAN	native	3	0	forb	perennial	honewort	
<i>Cynoglossum virginianum</i> var. <i>virginianum</i>	Boraginaceae	CYNVIR	native	5	5	forb	perennial	common wild comfrey	
<i>Cystopteris protrusa</i>	Cystopteridaceae	CYSPRO	native	4	-3	fern	perennial	common fragile fern	
<i>Danthonia spicata</i>	Poaceae	DANSPI	native	3	3	grass	perennial	poverty oat grass	
<i>Decodon verticillatus</i>	Lythraceae	DECVER	native	8	-5	shrub	perennial	swamp loosestrife	
<i>Delphinium tricorne</i>	Ranunculaceae	DELTRI	native	5	0	forb	perennial	dwarf larkspur	
<i>Diarrhena americana</i>	Poaceae	DIAAME	native	5	-3	grass	perennial	american beak grass	
<i>Dichanthelium boscii</i>	Poaceae	DICBOS	native	4	5	grass	perennial	bearded witch grass	
<i>Dichanthelium clandestinum</i>	Poaceae	DICCLA	native	3	-3	grass	perennial	deer-tongue grass	
<i>Dioscorea quaternata</i>	Dioscoreaceae	DIOQUA	native	5	3	vine	perennial	wild yam	
<i>Diphasiastrum digitatum</i>	Lycopodiaceae	DIPDIG	native	2	5	fern	perennial	trailing ground pine	
<i>Elaeagnus umbellata</i>	Elaeagnaceae	ELAUMB	non-native	0	3	shrub	perennial	autumn olive	
<i>Elephantopus carolinianus</i>	Asteraceae	ELECAR	native	5	0	forb	perennial	elephants foot	
<i>Epifagus virginiana</i>	Orobanchaceae	EPIVIR	native	8	5	forb	annual	beech drops	
<i>Erigeron philadelphicus</i> var. <i>philadelphicus</i>	Asteraceae	ERIPHI	native	3	-3	forb	perennial	marsh fleabane	
<i>Erythronium americanum</i> subsp. <i>americanum</i>	Liliaceae	ERYAME	native	5	5	forb	perennial	yellow adders tongue	
<i>Euonymus alata</i>	Celastraceae	EUOALA	non-native	0	5	shrub	perennial	winged euonymus	
<i>Euonymus fortunei</i>	Celastraceae	EUOFOR	non-native	0	5	shrub	perennial	winter-creeper	
<i>Eutrochium</i> sp.	Asteraceae	EUTSP	native	NA	NA	forb	perennial	joe pye weed	
<i>Fagus grandifolia</i>	Fagaceae	FAGGRA	native	8	3	tree	perennial	american beech	
<i>Fraxinus americana</i>	Oleaceae	FRAAME	native	4	3	tree	perennial	white ash	
<i>Fraxinus biltmoreana</i>	Oleaceae	FRABIL	native	4	3	tree	perennial	biltmore ash	
<i>Galium aparine</i>	Rubiaceae	GALAPA	native	1	3	forb	perennial	sticky-willy	
<i>Galium circaezans</i>	Rubiaceae	GALCIR	native	6	3	forb	perennial	wild licorice	
<i>Galium concinnum</i>	Rubiaceae	GALCON	native	5	3	forb	perennial	shining bedstraw	
<i>Galium triflorum</i>	Rubiaceae	GALTRI	native	5	3	forb	perennial	fragrant bedstraw	
<i>Geum vernum</i>	Rosaceae	GEUVER	native	1	3	forb	perennial	spring avens	
<i>Glechoma hederacea</i>	Lamiaceae	GLEHED	non-native	0	3	forb	perennial	ground ivy	
<i>Glyceria striata</i>	Poaceae	GLYSTR	native	4	-5	grass	perennial	fowl manna grass	
<i>Helianthus divaricatus</i>	Asteraceae	HELDIV	native	5	5	forb	perennial	woodland sunflower	
<i>Hybanthus concolor</i>	Violaceae	HYBCON	native	6	3	forb	perennial	green violet	
<i>Hydrangea arborescens</i>	Hydrangeaceae	HYDARB	native	7	3	shrub	perennial	wild hydrangea	
<i>Hydrastis canadensis</i>	Ranunculaceae	HYDRCA	native	7	3	forb	perennial	golden seal	Watchlist
<i>Hydrophyllum macrophyllum</i>	Boraginaceae	HYDMAC	native	7	3	forb	perennial	large-leaf waterleaf	
<i>Hypericum punctatum</i>	Hypericaceae	HYPPUN	native	3	0	forb	perennial	spotted st. johns wort	
<i>Impatiens capensis</i>	Balsaminaceae	IMPCAP	native	2	-3	forb	annual	spotted touch-me-not	
<i>Juglans nigra</i>	Juglandaceae	JUGNIG	native	2	3	tree	perennial	black walnut	
<i>Juniperus virginiana</i> var. <i>virginiana</i>	Cupressaceae	JUNVIR	native	2	3	shrub	perennial	eastern red cedar	
<i>Leersia virginica</i>	Poaceae	LEEVIR	native	4	-3	grass	perennial	white grass	
<i>Lemna minor</i>	Araceae	LEMMIN	native	3	-5	forb	perennial	small duckweed	

<i>Lindera benzoin</i>	Lauraceae	LINBEN	native	5	-3	shrub	perennial	hairy spicebush	
<i>Liriodendron tulipifera</i>	Magnoliaceae	LIRTUL	native	4	3	tree	perennial	tulip poplar	
<i>Lonicera japonica</i>	Caprifoliaceae	LONJAP	non-native	0	3	vine	perennial	japanese honeysuckle	
<i>Lonicera maackii</i>	Caprifoliaceae	LONMAA	non-native	0	5	shrub	perennial	amur honeysuckle	
<i>Luzula echinata</i>	Juncaceae	LUZECH	native	6	3	rush	perennial	common wood rush	
<i>Lycopus rubellus</i>	Lamiaceae	LYCRUB	native	8	-5	forb	perennial	stalked water horehound	
<i>Maianthemum racemosum</i> subsp. <i>Racemosum</i>	Asparagaceae	MAIRAC	native	4	3	forb	perennial	feathery false Solomon seal	
<i>Melilotus albus</i>	Fabaceae	MELALB	non-native	0	3	forb	biennial	white sweet clover	
<i>Microstegium vimineum</i>	Poaceae	MICVIM	non-native	0	0	grass	annual	japanese stiltgrass	
<i>Nabalus</i> sp.	Asteraceae	NABSP	native	NA	NA	forb	perennial	wild lettuce	
<i>Narcissus pseudonarcissus</i>	Amaryllidaceae	NARPSE	non-native	0	5	forb	perennial	common daffodil	
<i>Nyssa sylvatica</i>	Nyssaceae	NYSSYL	native	5	0	tree	perennial	black gum	
<i>Onoclea sensibilis</i>	Onocleaceae	ONOSEN	native	4	-3	fern	perennial	sensitive fern	
<i>Ophioglossum vulgatum</i>	Ophioglossaceae	OPHVUL	native	4	-3	fern	perennial	southern adders tongue fern	
<i>Osmunda claytoniana</i>	Osmundaceae	OSMDCL	native	8	0	fern	perennial	interrupted fern	
<i>Osmunda spectabilis</i>	Osmundaceae	OSMSPE	native	8	-5	fern	perennial	regal fern	
<i>Ostrya virginiana</i>	Betulaceae	OSTVIR	native	5	3	tree	perennial	hop hornbeam	
<i>Oxalis grandis</i>	Oxalidaceae	OXAGRA	native	8	3	forb	annual	great yellow wood-sorrel	
<i>Oxalis stricta</i>	Oxalidaceae	OXASTR	native	0	3	forb	perennial	tall wood-sorrel	
<i>Oxalis violacea</i>	Oxalidaceae	OXAVIO	native	7	5	forb	perennial	violet wood-sorrel	
<i>Packera aurea</i>	Asteraceae	PACAUR	native	4	-3	forb	perennial	golden ragwort	
<i>Packera obovata</i>	Asteraceae	PACOBO	native	7	3	forb	perennial	round-leaved ragwort	
<i>Panax quinquefolius</i>	Araliaceae	PANQUI	native	7	5	forb	perennial	ginseng	Watchlist
<i>Parthenocissus quinquefolia</i>	Vitaceae	PARQUI	native	2	3	vine	perennial	virginia creeper	
<i>Passiflora lutea</i>	Passifloraceae	PASLUT	native	7	5	vine	perennial	small passion flower	
<i>Perilla frutescens</i>	Lamiaceae	PERFRU	non-native	0	0	forb	annual	beefsteak plant	
<i>Pescicaria virginiana</i>	Polygonaceae	PERVIR	native	3	0	forb	perennial	jumpseed	
<i>Phegopteris hexagonoptera</i>	Thelypteridaceae	PHEHEX	native	7	3	fern	perennial	broad beech fern	
<i>Phlox divaricata</i>	Polemoniaceae	PHLDIV	native	5	3	forb	perennial	blue phlox	
<i>Phytolacca americana</i> var. <i>americana</i>	Phytolaccaceae	PHYAME	native	0	3	forb	perennial	pokeweed	
<i>Pilea pumila</i>	Urticaceae	PILPUM	native	2	-3	forb	annual	canada clearweed	
<i>Platanus occidentalis</i>	Platanaceae	PLAOCC	native	3	-3	tree	perennial	american sycamore	
<i>Poa pratensis</i>	Poaceae	POAPRA	non-native	0	0	grass	perennial	kentucky blue grass	
<i>Poa sylvestris</i>	Poaceae	POASYL	native	5	0	grass	perennial	woodland blue grass	
<i>Podophyllum peltatum</i>	Berberidaceae	PODPEL	native	3	3	forb	perennial	may apple	
<i>Polygonatum biflorum</i>	Asparagaceae	POLBIF	native	4	3	forb	perennial	small solomons seal	
<i>Polystichum acrostichoides</i>	Dryopteridaceae	POLACR	native	5	5	fern	perennial	christmas fern	
<i>Potentilla simplex</i>	Rosaceae	POTSIM	native	2	3	forb	perennial	common cinquefoil	
<i>Prunus serotina</i> var. <i>serotina</i>	Rosaceae	PRUSER	native	1	3	tree	perennial	wild black cherry	
<i>Pycnanthemum</i> sp.	Lamiaceae	PYCSP	native	NA	NA	forb	perennial	mountain mint	
<i>Quercus alba</i>	Fagaceae	QUEALB	native	5	3	tree	perennial	white oak	
<i>Quercus muehlenbergii</i>	Fagaceae	QUEMUE	native	4	3	tree	perennial	chinkapin oak	
<i>Quercus rubra</i>	Fagaceae	QUERUB	native	4	3	tree	perennial	northern red oak	
<i>Quercus velutina</i>	Fagaceae	QUEVEL	native	4	5	tree	perennial	black oak	
<i>Ranunculus abortivus</i>	Ranunculaceae	RANABO	native	0	-3	forb	perennial	little-leaf buttercup	
<i>Ranunculus recurvatus</i> var. <i>recurvatus</i>	Ranunculaceae	RANREC	native	5	-3	forb	perennial	hooked buttercup	
<i>Robinia pseudoacacia</i>	Fabaceae	ROBPSE	native	1	3	tree	perennial	black locust	
<i>Rosa multiflora</i>	Rosaceae	ROSMUL	non-native	0	3	shrub	perennial	japanese rose	
<i>Rubus allegheniensis</i>	Rosaceae	RUBALL	native	2	3	shrub	perennial	common blackberry	

Rubus occidentalis	Rosaceae	RUBOCC	native	1	5	shrub	perennial	black raspberry	
Rubus sp.	Rosaceae	RUBSP	native	NA	NA	shrub	perennial	dewberry	
Rumex crispus	Polygonaceae	RUMCRI	non-native	0	0	forb	perennial	curly dock	
Salvia lyrata	Lamiaceae	SALLYR	native	3	-3	forb	perennial	cancer weed	
Sambucus canadensis	Adoxaceae	SAMCAN	native	2	0	shrub	perennial	common elderberry	
Sanguinaria canadensis	Papaveraceae	SANCAN	native	5	-3	forb	perennial	bloodroot	
Sanicula canadensis	Apiaceae	SANCAN	native	2	3	forb	perennial	canadian black snakeroot	
Sanicula odorata	Apiaceae	SANODO	native	2	0	forb	perennial	clustered black snakeroot	
Sassafras albidum	Lauraceae	SASALB	native	1	3	forb	perennial	sassafras	
Smilax rotundifolia	Smilacaceae	SMIROT	native	4	0	vine	perennial	catbrier	
Smilax tamnoides	Smilacaceae	SMITAM	native	3	0	vine	perennial	bristly greenbrier	
Staphylea trifolia	Staphyleaceae	STATRI	native	5	0	shrub	perennial	bladdernut	
Stellaria media	Caryophyllaceae	STEMED	non-native	0	3	forb	annual	common chickweed	
Stellaria pubera	Caryophyllaceae	STEPUB	native	7	5	forb	perennial	great chickweed	
Taraxacum officinale	Asteraceae	TAROFF	non-native	0	3	forb	perennial	common dandelion	
Thalictrum dioicum	Ranunculaceae	THADIO	native	7	3	forb	perennial	early meadow rue	
Tilia americana	Malvaceae	TILAME	native	5	3	tree	perennial	american linden	
Toxicodendron radicans	Anacardiaceae	TOXRAD	native	1	0	vine	perennial	eastern poison ivy	
Triadenum cf. walteri	Hypericaceae	TRISP	native	NA	NA	forb	perennial	st johns wort	Watchlist
Trifolium repens	Fabaceae	TRIREP	non-native	0	3	forb	perennial	white clover	
Trillium recurvatum	Melanthiaceae	TRIREC	native	4	3	forb	perennial	red trillium	
Ulmus rubra	Ulmaceae	ULMRUB	native	3	0	tree	perennial	slippery elm	
Uvularia grandiflora	Colchicaceae	UVUGRA	native	7	5	forb	perennial	large flower bellwort	
Veratrum woodii	Melanthiaceae	VERWOO	native	7	5	forb	perennial	false hellebore	
Verbena urticifolia	Verbenaceae	VERURT	native	3	0	forb	perennial	white vervian	
Verbesina alternifolia	Asteraceae	VERALT	native	3	-3	forb	perennial	wingstem	
Viburnum acerifolium	Adoxaceae	VIBACE	native	8	5	shrub	perennial	maple-leaved arrowwood	
Viburnum prunifolium	Adoxaceae	VIBPRU	native	4	3	shrub	perennial	black haw	
Viola palmata var. palmata	Violaceae	VIOPAL	native	5	3	forb	perennial	cleft violet	
Viola pubescens var. eriocarpa	Violaceae	VIOPUB	native	5	3	forb	perennial	downy yellow violet	
Viola sororia	Violaceae	VIOSOR	native	1	0	forb	perennial	woolly blue violet	
Vitis vulpina	Vitaceae	VITVUL	native	3	0	vine	perennial	frost grape	
Vitis sp.	Vitaceae	VITSP	native	NA	NA	vine	perennial	grape	