

# Ecological Assessment and Rare Species Surveys of the Coleman Parcel, Barry State Game Area, Barry Co., Michigan



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Cover photograph: Seeps along Hill Creek, Barry State Game Area, Barry Co., Mich., July 27, 2016. Photograph by B.S. Slaughter.

## Executive Summary

In 2015—2016, Michigan Natural Features Inventory (MNFI) contracted with Michigan Department of Natural Resources (MDNR), Wildlife Division (WLD), to conduct ecological assessments at two state game/wildlife areas, including a recently acquired 15 hectare (37 acre) parcel in Barry State Game Area (SGA) in Barry County, Michigan, previously owned by Dave Coleman. MNFI conducted surveys in June—August 2016. Surveys resulted in the extension of existing element occurrences for prairie fen and *Myrica pensylvanica* (bayberry) and the redetection of eastern massasauga (*Sistrurus catenatus*) at the adjacent Hill Creek fen. The conservation value of the Coleman parcel and Hill Creek Fen can be maintained and improved by controlling invasive plants, especially *Frangula alnus* (glossy buckthorn) and *Phalaris arundinacea* (reed canary grass), using mechanical thinning and prescribed fire to reduce woody cover in degraded former fen, addressing hydrological disturbances such as channelized stream segments, and managing old field habitats for oak savanna to improve wildlife habitat.

## Introduction

In 2015—2016, MNFI contracted with MDNR WLD to conduct ecological assessments and targeted species surveys of selected recent or proposed land acquisitions. These surveys were envisioned to address strategies identified in the MDNR Managed Public Land Strategy, namely prioritizing and informing land acquisitions that may support (1) key state and federal threatened and endangered species (Division Land Acquisition Strategy 2.5), and (2) representative natural communities (Division Land Acquisition Strategy 2.6). The surveys were proposed to address Objective 3.3 identified in the MDNR WLD Guiding Principles and Strategies (GPS) strategic plan, namely, updating strategic guidance for WLD's land acquisition.

In spring 2016, three areas were identified for ecological assessments and targeted species surveys: the Coleman parcel and adjacent Hill Creek Fen in Barry State Game Area (addressed in this report), and two parcels within Wigwam Bay State Wildlife Area in Arenac County (addressed in a separate report).

### Survey Site

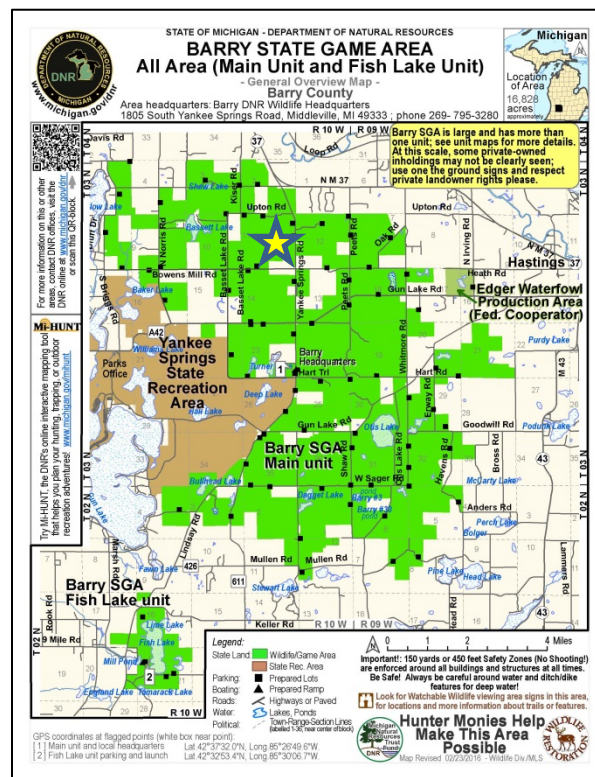
The Coleman parcel of the Barry State Game Area is located in western Barry County, encompassing a portion of Section 11, T03N R10W, and totaling approximately 15 hectares, or 37 acres (Figures 1 and 2). Hill Creek fen is northeast of the Coleman parcel. Historically, the topographically diverse proglacial outwash in this area supported a variety of natural communities, including oak – hickory forest and mixed oak savanna on well-drained soils and mixed conifer swamp and wet prairie (likely southern wet meadow and prairie fen) in depressions (Albert and Comer 2008).

## Methods

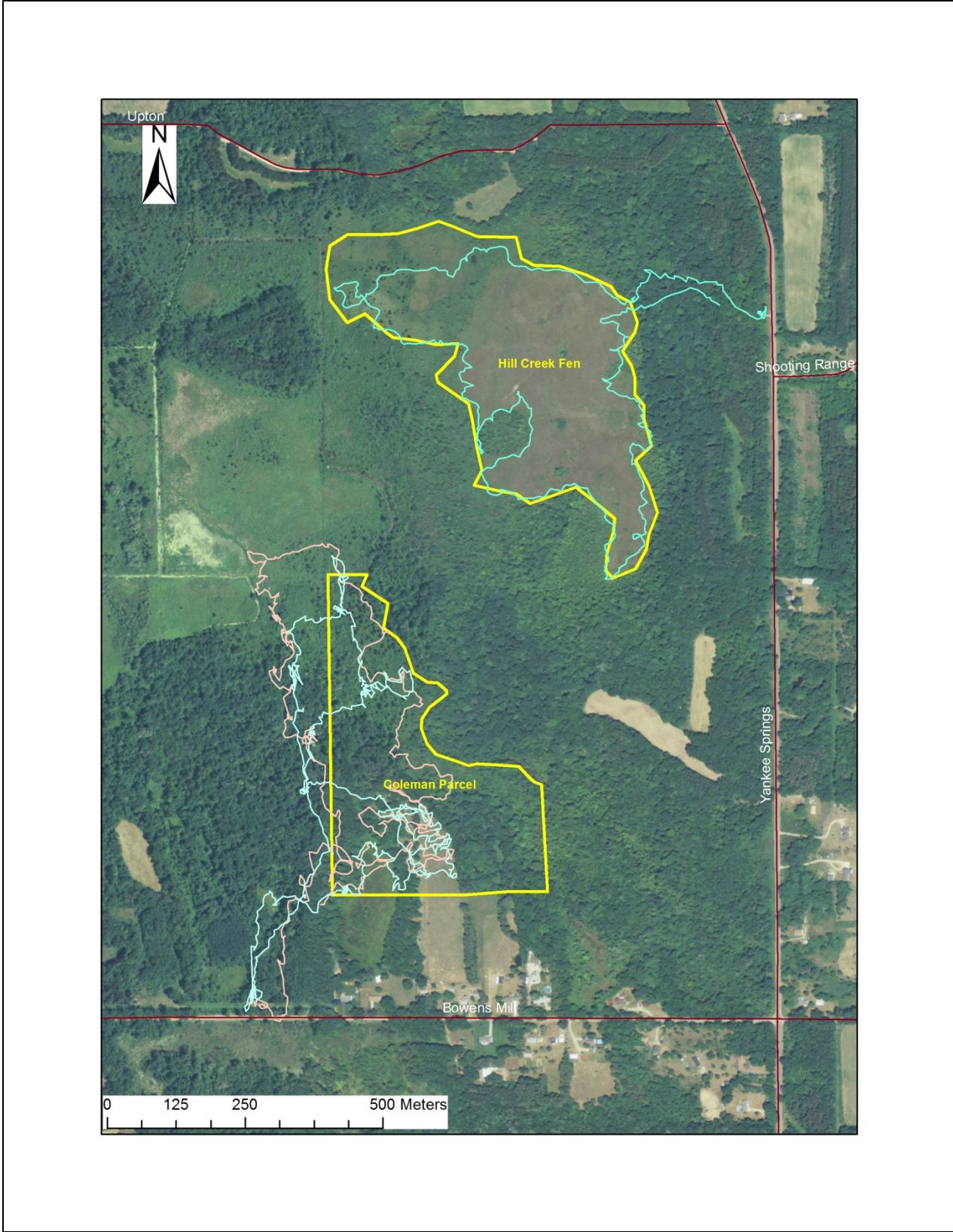
A meander survey of potential natural communities was conducted July 27, 2016. Lists of all vascular plants identified or keyed during surveys were taken, and threats to the ecological integrity of these areas (e.g., invasive plant species) were noted. Species lists were entered into the Universal FQA

Calculator (Freyman and Masters 2013) following the Michigan Floristic Quality Assessment Database (Reznicek et al. 2014). Natural communities were identified following Cohen et al. (2015).

Targeted surveys for potential state-listed reptiles and amphibians were conducted on June 29 and August 7, 2016 at the Coleman tract and July 1 and August 8, 2016 at the adjacent Hill Creek Fen. Surveys primarily targeted the eastern massasauga (*Sistrurus catenatus*, state special concern and proposed as federally threatened), but also focused on the eastern box turtle (*Terrapene carolina carolina*, state special concern), spotted turtle (*Clemmys guttata*, state threatened), and Blanding’s turtle (*Emydoidea blandingii*, state special concern), based on previously documented occurrences of these species at or near the project sites and available habitat at these sites. These species have been identified as Species of Greatest Conservation Need (SGCN) in Michigan’s updated Wildlife Action Plan, with the eastern massasauga and eastern box turtle identified as focal or priority SGCN for conservation actions (Derosier et al. 2015). Surveys also had potential for detecting several additional amphibian and reptile SGCN in Michigan’s Wildlife Action Plan (Derosier et al. 2015). These included the pickerel frog (*Lithobates palustris*), blue racer (*Coluber constrictor foxii*), northern ribbon snake (*Thamnophis sauritus septentrionalis*), northern ring-necked snake (*Diadophis punctatus edwardsii*), smooth green snake (*Opheodrys vernalis*), and gray rat snake (*Pantherophis spiloides*) (Derosier et al. 2015). Visual encounter surveys were conducted for the target species. Surveys focused on identifying new occurrences or expanding existing occurrences. Other amphibian and reptile species encountered incidentally during surveys in 2016 were also recorded. Survey routes are depicted in Figure 2.



**Figure 1.** Map of Barry State Game Area, Barry Co., Mich. Surveys were conducted in the northern portion of the SGA, south of Upton Road and west of Yankee Springs Road (T03N R10W S11).

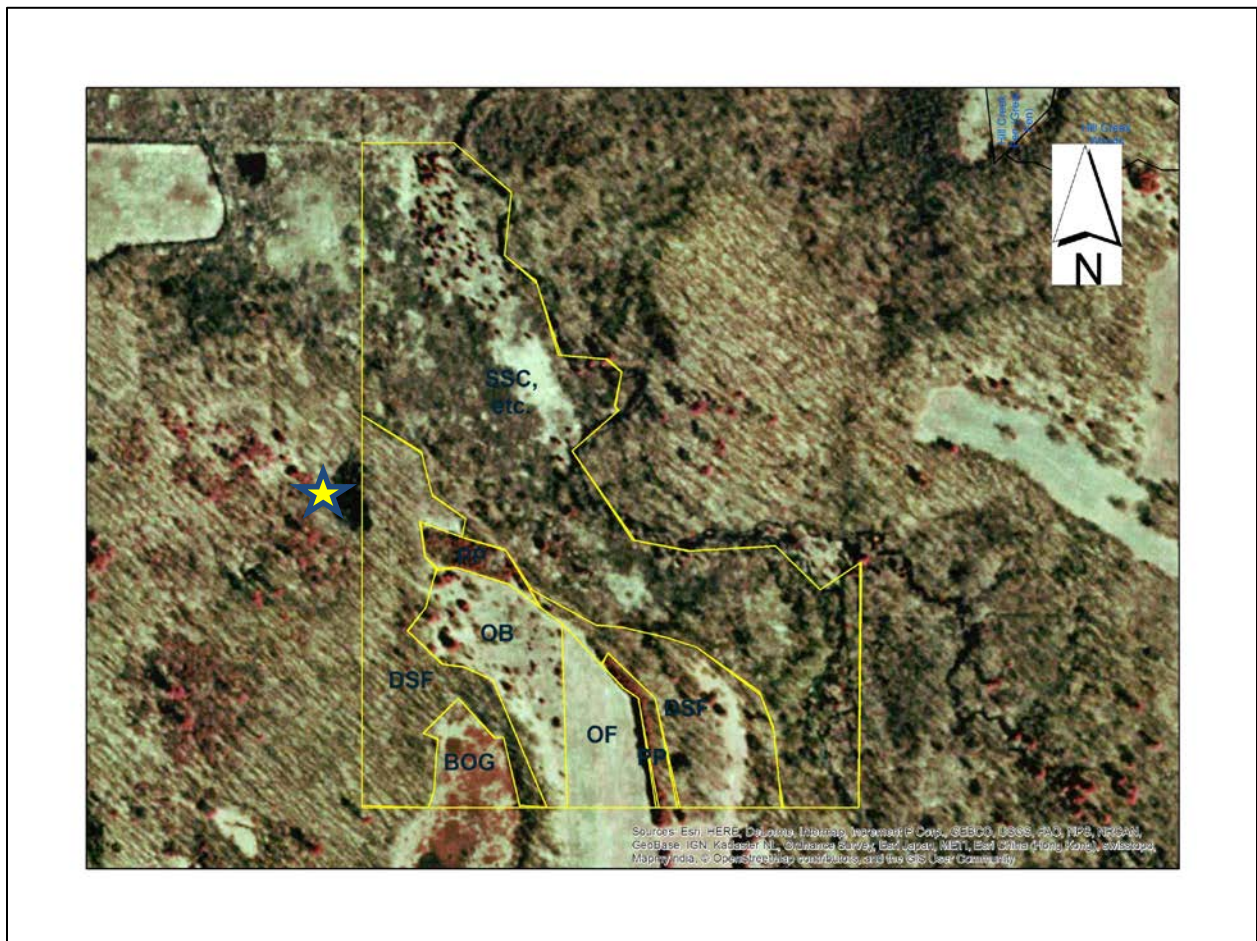


**Figure 2.** Survey sites and herptile visual encounter survey routes, June—August 2016.

## Results

### *Ecological Assessments*

Despite its small size, the Coleman tract of the Barry SGA supports a diversity of natural community types, including dry southern forest, oak barrens, southern hardwood swamp, rich tamarack swamp, southern shrub-carr, southern wet meadow, prairie fen, and bog (Figure 3). However, all of these habitats with the exception of seepages along Hill Creek have been impacted by anthropogenic disturbances, including logging (dry southern forest), agriculture (old field, oak barrens), haying/grazing (all habitats), and stream channelization and drainage (all wetlands except bog). In addition, long-term fire suppression has contributed to the conversion of former mixed oak savanna to closed-canopy forest.



**Figure 3.** Natural communities (and other habitats) identified at the Coleman parcel. DSF=dry southern forest; BOG=bog; OB=oak barrens; OF=old field; PP=Scots pine plantation; SSC, etc.= southern shrub-carr (primarily), with inclusions of southern hardwood swamp, rich tamarack swamp, southern wet meadow, and prairie fen. Note also the vernal pool at the western margin of the property (star).

## Uplands

Upland habitats are concentrated on the southeastern portion of the parcel and support dry southern forest, oak barrens, old field, and Scots pine plantings. The forest appears to have been impacted by frequent selection cuts and other uses such as hunting. The primary canopy species are *Quercus alba* (white oak) and *Prunus serotina* (black cherry), with *Quercus velutina* (black oak) locally co-dominant. Scattered *Pinus strobus* (white pine) occur throughout the area; some may have been planted. The forest is undergoing mesophication with *Acer rubrum* (red maple) occasional in the canopy and dominant in the understory. Shrubs are sparse. Ground cover is patchy and densest in canopy gaps. Characteristic species include *Carex pensylvanica* (Pennsylvania sedge), *Polygonatum pubescens* (downy Solomon seal), *Pteridium aquilinum* (bracken), *Maianthemum canadense* (Canada mayflower), *Galium circeazans* (white wild licorice), *G. triflorum* (fragrant bedstraw), and *Circaea canadensis* (enchanter's-nightshade).

East of the forest is a small clearing supporting oak barrens, immediately adjacent to a larger area of more recently farmed old field (Figures 3 and 4). The oak barrens, which likely developed following clearing and agricultural use, is characterized by black oak, *Sassafras albidum* (sassafras), *Rhus copallina* (shining sumac), *Rubus flagellaris* (dewberry), *Schizachyrium scoparium* (little bluestem), *Danthonia spicata* (poverty grass), *Euphorbia corollata* (flowering spurge), *Solidago nemoralis* (gray goldenrod), *Crocianthemum canadense* (common frostweed), and *Lespedeza capitata* (round-headed bush-clover). Common non-native species include *Hieracium caespitosum* (king devil), *Hypericum perforatum* (common St. John's-wort), *Phleum pratense* (timothy), *Rumex acetosella* (sheep sorrel), and *Poa pratensis* (Kentucky bluegrass). Ant mounds and ant activity were prevalent. The adjacent old field supports many of the same species but is more profoundly altered by agricultural activities. Little bluestem, dewberry, and *Centaurea stoebe* (spotted knapweed) are the dominant species, with *Pinus sylvestris* (Scots pine) invading from the adjacent plantings.



**Figure 4.** Oak barrens with patchy graminoid cover, bordered by dry southern forest and old field. Photo by Brad Slaughter.

## Wetlands

All of the wetlands on the parcel have been degraded by past land use practices such as drainage, haying, and grazing. The outwash channel along Hill Creek supports a complex of southern shrub-carr, southern wet meadow, and prairie fen, with small patches of rich tamarack swamp along the creek. This area likely once supported a larger prairie fen community, but historical drainage, haying, and grazing are likely responsible for peat degradation and the expansion of shrub-carr characterized by *Cornus foemina* (gray dogwood), *Corylus americana* (hazelnut), *Ilex verticillata* (Michigan holly), *Rosa multiflora* (multiflora rose), *R. palustris* (swamp rose), *Toxicodendron vernix* (poison sumac), and *Rhamnus alnifolia* (alder-leaved buckthorn). Other characteristic species of shrub-carr include *Rubus* spp. (blackberries), *Carex lacustris* (lake sedge), *Onoclea sensibilis* (sensitive fern), and *Symphyotrichum firmum* (smooth swamp aster). *Frangula alnus* (glossy buckthorn) is occasional. Patches of open southern wet meadow are locally dominated by *Phalaris arundinacea* (reed canary grass), associated with *Solidago gigantea* (late goldenrod), smooth swamp aster, gray dogwood, *Spiraea alba* (meadowsweet), and *Symphyotrichum lanceolatum* (panicled aster).

Small patches of prairie fen occur in association with seepages along and near Hill Creek. In the northern portion of the parcel, peats dried by drainage and impacted by haying and/or grazing now support stands of *Juniperus virginiana* (red-cedar) and scattered *Ulmus americana* (American elm), associated with gray dogwood, poison sumac, glossy buckthorn, *Dasiphora fruticosa* (shrubby cinquefoil), meadowsweet, alder-leaved buckthorn, *Hypericum prolificum* (shrubby St. John's-wort), *Carex stricta* (tussock sedge), reed canary grass, *Solidago rugosa* (rough-leaved goldenrod), *Pycnanthemum virginianum* (common mountain mint), and *Andropogon gerardii* (big bluestem). Less impacted springs to the south support higher quality patches of fen supporting *Larix laricina* (tamarack), poison sumac, *Vaccinium corymbosum* (highbush blueberry), shrubby cinquefoil, several sedges (*Carex buxbaumii*, *C. flava*, *C. interior*, *C. lasiocarpa*, and *C. stricta*), and *Sphagnum* spp. (sphagnum mosses). Diverse substrates including seeps, marl pools, and sedge- and moss-dominated hummocks in these very small areas support high vascular plant species richness (Figures 3 and 5).

Portions of two other small wetlands occur on the Coleman parcel: (1) a degraded bog on shallow peat dominated by *Chamaedaphne calyculata* (leatherleaf) and *Scirpus cyperinus* (wool-grass) on *Sphagnum* mosses, and (2) the eastern fringe of a small, seasonally inundated vernal pool with red maple, *Acer saccharinum* (silver maple), highbush blueberry, *Osmunda cinnamomea* (cinnamon fern), *Glyceria striata* (fowl manna grass), *Boehmeria cylindrica* (false nettle), and *Symplocarpus foetidus* (skunk-cabbage) (Figure 3).





**Figure 5.** Small pockets of prairie fen occur in seeps along Hill Creek. Photo by Brad Slaughter.

#### *Floristic Quality Assessment and Rare Plant Surveys*

A total of 235 vascular plants were identified to the species level, including 213 (91%) native taxa (Appendices 1-3). The uplands support primarily native, disturbance-tolerant generalists (Appendix 2), but the wetlands support several conservative species characteristic of sensitive habitats, such as *Carex buxbaumii* (Buxbaum's sedge), *Cladium mariscoides* (twig-rush), *Eleocharis rostellata* (twig-rush), *Lobelia kalmii* (bog lobelia), *Lysimachia quadriflora* (whorled loosestrife), *Triantha glutinosa* (false asphodel), and *Valeriana uliginosa* (bog valerian) (Appendix 3). The state threatened *Myrica pensylvanica* (bayberry), first documented as a native Michigan species from the adjacent Hill Creek/Great Fen by A. A. Reznicek (University of Michigan) in 2003, occurs very locally along Hill Creek in small pockets of spring fen (Figure 6). No other state-listed vascular plant species were documented during the survey.

#### *Rare Herptile Surveys*

No rare and/or declining amphibian or reptile species were encountered on the Coleman parcel during herptile surveys in 2016. A northern leopard frog (*Lithobates pipiens*) was heard calling from the southern wet meadow north of the bog on June 29. An eastern massasauga was documented on the west side of Hill Creek Fen on August 8. It was underneath a thick patch of shrubby cinquefoil. A northern ribbonsnake was observed basking in a shrubby cinquefoil along the northeast side of the fen on July 1. No eastern box turtles, spotted turtles, Blanding's turtles, or other rare and/or declining amphibian or reptile species were observed during surveys in Hill Creek Fen in 2016.



**Figure 6.** The state threatened *Myrica pensylvanica* (bayberry) occurs locally in springs along Hill Creek. Photo by Brad Slaughter.

## **Discussion**

### *Ecological Assessments and Recommendations*

The dry southern forest and bog are degraded and unremarkable. Greater potential lies in managing and restoring the adjacent oak barrens and wetland communities, particularly considering the presence of prairie fen and several rare plant and animal taxa in and near the adjacent Hill Creek fen. Drainage, clearing, and haying and/grazing have significantly altered most of the shallow lake basin and drainage along Hill Creek, reducing acreage of element occurrence quality prairie fen to ca. 20 hectares (50 acres). A management strategy including mechanical thinning/clearing, herbicide, and prescribed fire have the potential to increase acreage of open wetland communities, including prairie fen and southern wet meadow, along Hill Creek. Invasive species treatments should focus on reduction of multiflora rose, reed canary grass, and glossy buckthorn. Because drainage has aerated and oxidized portions of the peat soils in this area, long-term woody species management will be required to maintain open conditions. Care should be taken to avoid direct impacts to springs and seeps in the immediate vicinity of Hill Creek. Vegetation and soils in these areas could be negatively impacted by foot traffic, mechanical disturbance, or direct ignition. For additional management recommendations for the Hill Creek fen complex, see Cohen et al. (2014).

The limited area of oak barrens and the larger area of sandy old field can be managed with a combination of mechanical treatment and herbicide for target species (Scots pine, spotted knapweed)

and prescribed fire to maintain open conditions and promote the persistence and expansion of native grasses and forbs. Disking and seeding should be avoided in the remnant oak barrens, but both should be considered in the restoration of the more disturbed old field area. Removal of Scots pines is also recommended to reduce propagule pressure in the openings and to improve connectivity between the openings and adjacent dry southern forests and wetlands.

#### *Rare Plants*

*Myrica pensylvanica* (bayberry) is known from very few populations that are considered native in Michigan, although the species is a fairly popular ornamental and is used occasionally in wildlife plantings, from which it sometimes spreads vegetatively (Reznicek et al. 2011). The colonies on and in the vicinity of the Coleman parcel are within 1 km of the larger population first documented in 2003 at Hill Creek Fen and will be entered into the MNFI natural heritage database as part of the same element occurrence.

#### *Rare Herptiles*

Potential exists for rare and/or declining amphibian and reptile species and additional SGCN to occur on the Coleman Parcel, particularly the eastern massasauga, eastern box turtle, Blanding's turtle, pickerel frog, blue racer, and northern ribbon snake. The wetlands in the northern half of the parcel, in particular, appear to provide suitable habitat for these species. These species may not have been observed during surveys in 2016 because the tall, dense vegetation and shrub encroachment in the southern wet meadow made it difficult to see individuals of these species. The hot and dry weather and site conditions prior to and during the surveys also likely resulted in individuals of these species remaining under cover or underground, which would have contributed to these species not being detected during the surveys. These species also are difficult to detect in the field in general, and often require multiple survey visits to detect them. Additional surveys for these species should be conducted on the Coleman Parcel. Management efforts to reduce woody shrub cover, remove or control invasive species, and restore more open conditions in the southern wet meadow and shrub carr would enhance habitat and survey conditions for these species on this parcel.

Although only one eastern massasauga and one northern ribbon snake were observed during surveys of the Hill Creek Fen in 2016, extensive habitat for these species and other targeted rare herp species and SGCN remains available at this site. Eastern massasaugas, eastern box turtles, spotted turtles, northern ribbon snakes, and blue racers have been documented in multiple areas during previous surveys within Hill Creek Fen (Figure 7, MNFI 2016), and are likely to occur throughout the fen based on habitat availability. These species might not have been documented during surveys in 2016 due to hot and dry weather conditions prior to and during surveys. Also, as already mentioned, these species are fairly cryptic, and multiple surveys are often needed to detect these species. The eastern massasauga, eastern box turtle, and spotted turtle element occurrences or populations at Hill Creek Fen have been ranked as having excellent to good estimated viability or probability of persisting into the foreseeable future (i.e., at least 20-30 years), if current conditions prevail, based on NatureServe's generic guidelines for ranking species occurrences (Hammerson et al. 2008). Although the size of these populations is unknown, they

have been ranked as having excellent to good probability of persisting into the foreseeable future because of extensive suitable habitat available at this site, the species' known and potential extent or occupied area, the species' history of occurrence at this site, and the long-lived nature of these species. Blanding's turtles have not been documented within the fen (Figure 7), but have been documented at multiple locations within 1-2 miles of the fen, and have potential to occur within the fen. Eastern hog-nosed snake (*Heterodon platirhinos*), eastern garter snake (*Thamnophis sirtalis sirtalis*), northern brown snake (*Storeria dekayi dekayi*), and northern leopard frog also had been documented in the fen during surveys prior to 2016.

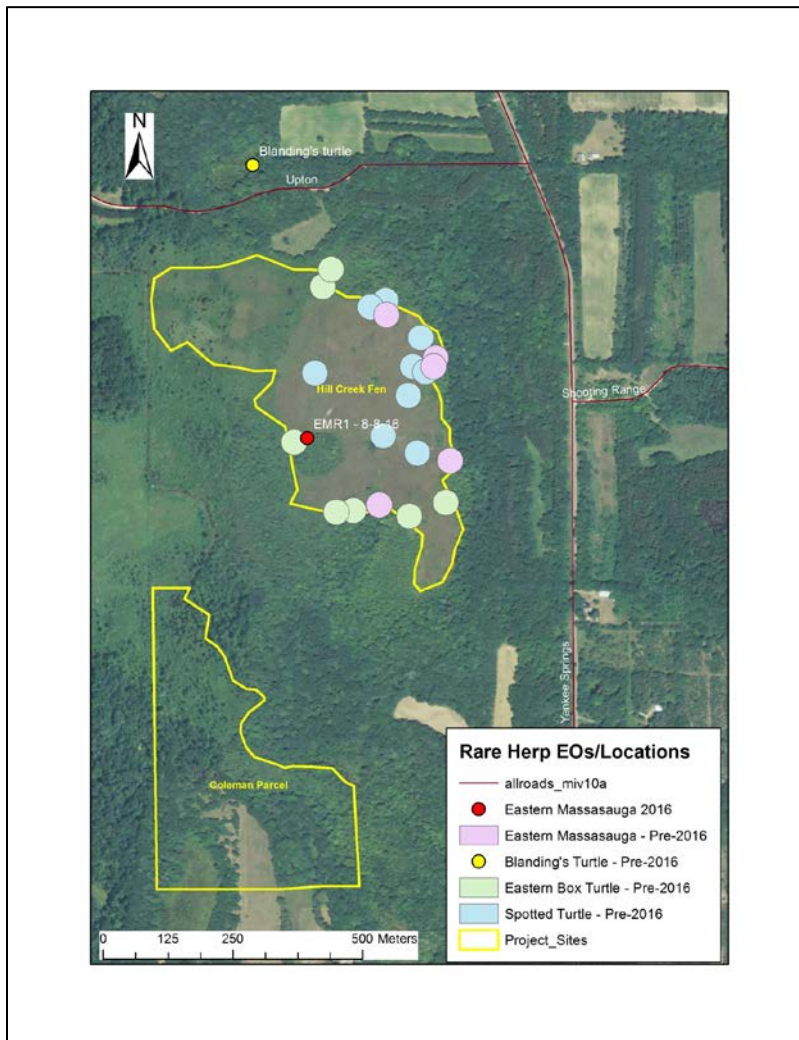
The habitat within Hill Creek Fen is still primarily in good condition for rare amphibian and reptile species such as the eastern massasauga, spotted turtle, eastern box turtle, Blanding's turtle, and other species associated with prairie fen and open wetland habitats. However, woody shrub encroachment and several invasive plant species, such as glossy buckthorn and reed canary grass, are locally dominant and threatening the habitat for these species at this site. Because these invasive species currently occur in fairly small, discrete patches within the fen, efforts to be control or remove them now would be more efficient and effective, and are recommended. Maintaining open wetland habitat conditions is critical for protecting habitat for these species. Additional management recommendations and information are provided in Cohen et al. (2014).

Disruption of natural ecological processes, hydrological alterations, vegetative succession, invasive species, residential and agricultural development, and roads have resulted in the loss, degradation, and fragmentation of habitat for rare and declining and other herp species in and around the Coleman Parcel, Hill Creek Fen, and the Barry State Game Area in general. Maintaining viable populations of rare and common herp species will require maintaining and restoring large complexes of open wetland and adjacent uplands both open and forested. Management efforts that maintain, restore, and expand habitat complexes comprised of diverse open wetlands and connected open and forested uplands in multiple locations within the game area would help ensure sufficient habitat is available to maintain viable populations of rare and common herp species.

Potential exists for additional rare and/or declining herp species and/or SGCN to be documented within the Coleman Parcel and/or Hill Creek Fen. These include the pickerel frog and smooth green snake in the open wetland habitats, and the northern ring-necked snake and gray rat snake in the adjacent forests. Kirtland's snake (*Clonophis kirtlandii*) is a state endangered species that also has potential to occur in the sedge meadow and prairie fen habitats within the Coleman Parcel and Hill Creek Fen, particularly areas with crayfish burrows. This species was not targeted for surveys in 2016 because of the cryptic nature of this species, and difficulty detecting this species without targeted surveys using coverboards and repeated survey visits. Additional targeted surveys for these species would help determine whether these species occur at these two sites, and would help inform management of these sites. Additional surveys in the northwest portion of Hill Creek Fen are particularly warranted since MNFI's previous surveys focused on other parts of the fen (MNFI 2016, Lee pers. comm.).

In addition to observations of rare and declining amphibian and reptile species and SGCN, several vernal pools or potential vernal pools were encountered during the surveys. Vernal pools are small, generally

isolated, temporary pools of water or wetlands that form in shallow depressions in forested areas throughout Michigan (Thomas et al. 2010). These wetlands fill with water from rainfall, snowmelt, and/or groundwater between late fall and spring, and usually dry up by mid to late summer. The periodic drying of vernal pools prevents fish from establishing populations in these wetlands. Because vernal pools lack predatory fish populations, these wetlands provide critical breeding habitat for a host of forest-dwelling amphibians and invertebrates, including some species that are specialized for life in vernal pools and depend on these unique habitats for their survival. These include the blue-spotted salamander (*Ambystoma laterale*), spotted salamander (*Ambystoma maculatum*), wood frog (*Rana sylvatica*), and fairy shrimp (*Eubranchipus* spp.) (Colburn 2004, Calhoun and deMaynadier 2008). One verified vernal pool and one potential vernal pool were found in upland forest along the western edge of the Coleman Parcel (Figure 8), and one potential vernal pool was found in upland forest to the east of Hill Creek Fen. The potential vernal pools were dry, and need to be surveyed in the spring to verify they hold water for part of the year. Additionally, a wood frog was found on the edge of one of the vernal pools along the western edge of the Coleman Parcel.



**Figure 7.** Locations of rare herpetile populations in the study area documented in 2016 and earlier.



**Figure 8.** Bottom of a dried vernal pool, Coleman parcel. Photo by Yu Man Lee.

### **Acknowledgments**

Several individuals provided valuable assistance on this project. Jennifer Olson and Valerie Frawley (WLD) developed the project and identified target survey sites; Sara Schaefer (WLD) suggested survey targets; Marshall Strong (WLD) produced a site map; and Brian Klatt, Nancy Toben, and Robin Lenkart (MNFI) provided administrative support.

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**Appendix 1. Coleman tract Floristic Quality Summary.**

07/27/2016

Barry State Game Area

Barry

MI

USA

FQA DB Region:

Michigan

FQA DB Publication Year:

2014

FQA DB Description:

Reznicek, A.A., M.R. Penskar, B.S. Walters, and B.S. Slaughter. 2014. Michigan Floristic Quality Assessment Database. Herbarium, University of Michigan, Ann Arbor, MI and Michigan Natural Features Inventory, Michigan State University, Lansing, MI. <http://michiganflora.net>

Practitioner:

Brad Slaughter

Latitude:

42.656662

Longitude:

-85.456251

Weather Notes:

Duration Notes:

Community Type Notes:

Dry southern forest, Scots pine plantation, oak barrens, old field, southern hardwood swamp, rich tamarack swamp, southern shrub-carr, southern wet meadow, prairie fen, bog

Other Notes:

Also: *Crataegus* sp., *Lemna* sp., *Pilea* sp., *Prenanthes* sp., *Sparganium* sp. *Myrica pensylvanica* is apparently native here.

Conservatism-Based Metrics:

Total Mean C:

4.2

Native Mean C:

4.6

Total FQI:

64.4

Native FQI:

67.1

Adjusted FQI:

43.8

% C value 0:

11.5

% C value 1-3:

24.7

% C value 4-6:

47.7

% C value 7-10:

16.2



Native Tree Mean C: 3.6  
 Native Shrub Mean C: 4.5  
 Native Herbaceous Mean C: 4.7

Species Richness:  
 Total Species: 235  
 Native Species: 213 90.60%  
 Non-native Species: 22 9.40%

Species Wetness:  
 Mean Wetness: -0.3  
 Native Mean Wetness: -0.6

Physiognomy Metrics:  
 Tree: 16 6.80%  
 Shrub: 37 15.70%  
 Vine: 10 4.30%  
 Forb: 109 46.40%  
 Grass: 26 11.10%  
 Sedge: 25 10.60%  
 Rush: 0 0%  
 Fern: 12 5.10%  
 Bryophyte: 0 0%

Duration Metrics:  
 Annual: 8 3.40%  
 Perennial: 222 94.50%  
 Biennial: 5 2.10%  
 Native Annual: 6 2.60%  
 Native Perennial: 204 86.80%  
 Native Biennial: 3 1.30%

**Species:**

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
Acer rubrum	Sapindaceae	ACERUB	native	1	0	tree	perennial	red maple

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
Acer saccharinum	Sapindaceae	ACESAI	native	2	-3	tree	perennial	silver maple
Achillea millefolium	Asteraceae	ACHMIL	native	1	3	forb	perennial	yarrow
Ageratina altissima; eupatorium rugosum	Asteraceae	AGEALT	native	4	3	forb	perennial	white snakeroot
Agrimonia gryposepala	Rosaceae	AGRGRY	native	2	3	forb	perennial	tall agrimony
Agrostis gigantea	Poaceae	AGRIGIG	non-native	0	-3	grass	perennial	redtop
Agrostis hyemalis	Poaceae	AGRHYE	native	4	0	grass	perennial	ticklegrass
Ambrosia artemisiifolia	Asteraceae	AMBART	native	0	3	forb	annual	common ragweed
Amelanchier interior	Rosaceae	AMEINT	native	4	5	shrub	perennial	serviceberry
Amphicarpaea bracteata	Fabaceae	AMPBRA	native	5	0	vine	annual	hog-peanut
Andropogon gerardii	Poaceae	ANDGER	native	5	0	grass	perennial	big bluestem
Anemone virginiana	Ranunculaceae	ANEVIR	native	3	3	forb	perennial	thimbleweed
Angelica atropurpurea	Apiaceae	ANGATR	native	6	-5	forb	perennial	purplestem angelica
Apocynum androsaemifolium	Apocynaceae	APOAND	native	3	5	forb	perennial	spreading dogbane
Apocynum cannabinum; a. sibiricum	Apocynaceae	APOCAN	native	3	0	forb	perennial	indian-hemp
Aralia nudicaulis	Araliaceae	ARANUD	native	5	3	forb	perennial	wild sarsaparilla
Artemisia campestris	Asteraceae	ARTCAM	native	5	5	forb	biennial	wormwood
Asclepias incarnata	Apocynaceae	ASCINC	native	6	-5	forb	perennial	swamp milkweed
Asclepias syriaca	Apocynaceae	ASCSYR	native	1	5	forb	perennial	common milkweed
Asclepias tuberosa	Apocynaceae	ASCTUB	native	5	5	forb	perennial	butterfly-weed
Athyrium filix-femina	Athyriaceae	ATHFIL	native	4	0	fern	perennial	lady fern
Berberis thunbergii	Berberidaceae	BERTHU	non-native	0	3	shrub	perennial	japanese barberry
Berteroa incana	Brassicaceae	BERINC	non-native	0	5	forb	annual	hoary alyssum
Betula pumila	Betulaceae	BETPUM	native	8	-5	shrub	perennial	bog birch
Boehmeria cylindrica	Urticaceae	BOECYL	native	5	-5	forb	perennial	false nettle
Bromus ciliatus	Poaceae	BROCIL	native	6	-3	grass	perennial	fringed brome
Bromus inermis	Poaceae	BROINE	non-native	0	5	grass	perennial	smooth brome
Caltha palustris	Ranunculaceae	CALPAR	native	6	-5	forb	perennial	marsh-marigold
Carex aquatilis	Cyperaceae	CXAQUA	native	7	-5	sedge	perennial	sedge
Carex buxbaumii	Cyperaceae	CXBUXB	native	10	-5	sedge	perennial	sedge
Carex comosa	Cyperaceae	CXCOMO	native	5	-5	sedge	perennial	sedge
Carex cryptolepis	Cyperaceae	CXCRYP	native	8	-5	sedge	perennial	sedge
Carex flava	Cyperaceae	CXFLAV	native	4	-5	sedge	perennial	sedge
Carex hystericina	Cyperaceae	CXHYST	native	2	-5	sedge	perennial	sedge
Carex interior	Cyperaceae	CXINTE	native	3	-5	sedge	perennial	sedge

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
Carex intumescens	Cyperaceae	CXINTU	native	3	-3	sedge	perennial	sedge
Carex lacustris	Cyperaceae	CXLACU	native	6	-5	sedge	perennial	sedge
Carex leptalea	Cyperaceae	CXLEPA	native	5	-5	sedge	perennial	sedge
Carex pensylvanica	Cyperaceae	CXPENS	native	4	5	sedge	perennial	sedge
Carex rosea; c. convoluta	Cyperaceae	CXROSE	native	2	5	sedge	perennial	curly-styled wood sedge
Carex siccata; c. foenea	Cyperaceae	CXSICC	native	5	5	sedge	perennial	sedge
Carex stipata	Cyperaceae	CXSTIP	native	1	-5	sedge	perennial	sedge
Carex stricta	Cyperaceae	CXSTRI	native	4	-5	sedge	perennial	sedge
Carex swanii	Cyperaceae	CXSWAN	native	4	3	sedge	perennial	sedge
Carex trisperma	Cyperaceae	CXTRIS	native	9	-5	sedge	perennial	sedge
Carex utriculata; c. rostrata	Cyperaceae	CXUTRI	native	5	-5	sedge	perennial	sedge
Centaurea stoebe; c. maculosa	Asteraceae	CENSTO	non-native	0	5	forb	biennial	spotted knapweed
Chamaedaphne calyculata	Ericaceae	CHACAL	native	8	-5	shrub	perennial	leatherleaf
Chelone glabra	Plantaginaceae	CHEGLB	native	7	-5	forb	perennial	turtlehead
Chondrilla juncea	Asteraceae	CHOJUN	non-native	0	5	forb	perennial	skeleton-weed
Cinna arundinacea	Poaceae	CINARU	native	7	-3	grass	perennial	wood reedgrass
Circaea canadensis; c. lutetiana	Onagraceae	CIRCAN	native	2	3	forb	perennial	enchanters-nightshade
Cirsium muticum	Asteraceae	CIRMUT	native	6	-5	forb	biennial	swamp thistle
Cladium mariscoides	Cyperaceae	CLAMAR	native	10	-5	sedge	perennial	twig-rush
Clematis virginiana	Ranunculaceae	CLEVIR	native	4	0	vine	perennial	virgins bower
Cornus florida	Cornaceae	CORFLO	native	8	3	tree	perennial	flowering dogwood
Cornus foemina	Cornaceae	CORFOE	native	1	0	shrub	perennial	gray dogwood
Corylus americana	Betulaceae	CORAMA	native	5	3	shrub	perennial	hazelnut
Crocyanthemum canadense; helianthemum c.	Cistaceae	CROCAN	native	8	5	forb	perennial	common frostweed
Cryptotaenia canadensis	Apiaceae	CRYCAN	native	2	0	forb	perennial	honestwort
Cyperus lupulinus; c. filiculmis	Cyperaceae	CYPLUP	native	2	3	sedge	perennial	slender sand sedge
Cypripedium acaule	Orchidaceae	CYPACA	native	5	-3	forb	perennial	pink lady-slipper; moccasin flower
Danthonia spicata	Poaceae	DANSPI	native	4	5	grass	perennial	poverty grass; oatgrass
Dasiphora fruticosa; potentilla f.	Rosaceae	DASFRU	native	8	-3	shrub	perennial	shrubby cinquefoil
Deschampsia cespitosa	Poaceae	DESCES	native	9	-3	grass	perennial	hair grass
Desmodium canadense	Fabaceae	DESCAD	native	3	0	forb	perennial	showy tick-trefoil
Dichanthelium columbianum; panicum c.	Poaceae	DICCOL	native	5	3	grass	perennial	panic grass
Dichanthelium depauperatum; panicum d.	Poaceae	DICDEP	native	4	5	grass	perennial	panic grass
Dichanthelium dichotomum; panicum d.	Poaceae	DICDIC	native	7	0	grass	perennial	panic grass

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Dichanthelium implicatum; panicum i.	Poaceae	DICIMP	native	3	0	grass	perennial	panic grass
Dichanthelium latifolium; panicum l.	Poaceae	DICLAT	native	5	3	grass	perennial	broad-leaved panic grass
Digitaria cognata; leptoloma c.	Poaceae	DIGCOG	native	3	5	grass	perennial	fall witch grass
Dioscorea villosa; dioscorea villosa	Dioscoreaceae	DIOVIL	native	4	0	forb	perennial	wild yam
Doellingeria umbellata; aster u.	Asteraceae	DOEUMB	native	5	-3	forb	perennial	flat-topped white aster
Drosera rotundifolia	Droseraceae	DROROT	native	6	-5	forb	perennial	round-leaved sundew
Dryopteris carthusiana	Dryopteridaceae	DRYCAR	native	5	-3	fern	perennial	spinulose woodfern
Dryopteris cristata	Dryopteridaceae	DRYCRI	native	6	-5	fern	perennial	crested shield fern
Elaeagnus umbellata	Elaeagnaceae	ELAUMB	non-native	0	3	shrub	perennial	autumn-olive
Eleocharis elliptica	Cyperaceae	ELEELL	native	6	-5	sedge	perennial	golden-seeded spike rush
Eleocharis rostellata	Cyperaceae	ELEROS	native	10	-5	sedge	perennial	spike-rush
Elymus trachycaulus; agropyron t.	Poaceae	ELYTRA	native	8	3	grass	perennial	slender wheatgrass
Equisetum arvense	Equisetaceae	EQUARV	native	0	0	fern	perennial	common horsetail
Equisetum fluviatile	Equisetaceae	EQUFLU	native	7	-5	fern	perennial	water horsetail
Erigeron strigosus	Asteraceae	ERISTR	native	4	3	forb	perennial	daisy fleabane
Eupatorium perfoliatum	Asteraceae	EUPPER	native	4	-3	forb	perennial	boneset
Euphorbia corollata	Euphorbiaceae	EUPCOR	native	4	5	forb	perennial	flowering spurge
Eurybia macrophylla; aster m.	Asteraceae	EURMAC	native	4	5	forb	perennial	big-leaved aster
Euthamia graminifolia	Asteraceae	EUTGRA	native	3	0	forb	perennial	grass-leaved goldenrod
Eutrochium maculatum; eupatorium m.	Asteraceae	EUTMAC	native	4	-5	forb	perennial	joe-pye-weed
Fallopia scandens; polygonum s.	Polygonaceae	FALSCA	native	2	0	vine	perennial	false buckwheat
Festuca subverticillata; f. obtusa	Poaceae	FESSUB	native	5	3	grass	perennial	nodding fescue
Frangula alnus; rhamnus frangula	Rhamnaceae	FRAALN	non-native	0	0	shrub	perennial	glossy buckthorn
Galium circaezans	Rubiaceae	GALCIR	native	4	3	forb	perennial	white wild licorice
Galium pilosum	Rubiaceae	GALPIL	native	6	5	forb	perennial	hairy bedstraw
Galium triflorum	Rubiaceae	GALTRR	native	4	3	forb	perennial	fragrant bedstraw
Gaultheria procumbens	Ericaceae	GAUPRO	native	5	3	shrub	perennial	wintergreen
Gaylussacia baccata	Ericaceae	GAYBAC	native	7	3	shrub	perennial	huckleberry
Geum canadense	Rosaceae	GEUCAN	native	1	0	forb	perennial	white avens
Glyceria striata	Poaceae	GLYSTR	native	4	-5	grass	perennial	fowl manna grass
Goodyera pubescens	Orchidaceae	GOOPUB	native	7	3	forb	perennial	downy rattlesnake plantain
Helianthus giganteus	Asteraceae	HELGIG	native	5	-3	forb	perennial	tall sunflower
Hieracium gronovii	Asteraceae	HIEGRO	native	5	5	forb	perennial	hairy hawkweed
Hieracium caespitosum	Asteraceae	HIECAE	non-native	0	5	forb	perennial	king devil

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Hylodesmum glutinosum; desmodium g.	Fabaceae	HYLGLU	native	5	5	forb	perennial	clustered-leaved tick-trefoil
Hylodesmum nudiflorum; desmodium n.	Fabaceae	HYLNUD	native	7	5	forb	perennial	naked tick-trefoil
Hypericum prolificum	Hypericaceae	HYPPRO	native	5	3	shrub	perennial	shrubby st. johns-wort
Ilex verticillata	Aquifoliaceae	ILEVER	native	5	-3	shrub	perennial	michigan holly
Impatiens capensis	Balsaminaceae	IMPCAP	native	2	-3	forb	annual	spotted touch-me-not
Iris virginica	Iridaceae	IRIVIR	native	5	-5	forb	perennial	southern blue flag
Juncus tenuis	Juncaceae	JUNTEN	native	1	0	forb	perennial	path rush
Juniperus virginiana	Cupressaceae	JUNVIR	native	3	3	tree	perennial	red-cedar
Krigia virginica	Asteraceae	KRIVIR	native	4	5	forb	annual	dwarf dandelion
Larix laricina	Pinaceae	LARLAR	native	5	-3	tree	perennial	tamarack
Lathyrus palustris	Fabaceae	LATPAL	native	7	-3	vine	perennial	marsh pea
Lechea mucronata; l. villosa	Cistaceae	LECMUC	native	5	5	forb	perennial	hairy pinweed
Leersia oryzoides	Poaceae	LEEORY	native	3	-5	grass	perennial	cut grass
Lespedeza capitata	Fabaceae	LESCAP	native	5	3	forb	perennial	round-headed bush-clover
Liatris spicata	Asteraceae	LIASPI	native	8	0	forb	perennial	marsh blazing-star
Lindera benzoin	Lauraceae	LINBEN	native	7	-3	shrub	perennial	spicebush
Liparis loeselii	Orchidaceae	LIPLOE	native	5	-3	forb	perennial	loesels twayblade
Lobelia kalmii	Campanulaceae	LOBKAL	native	10	-5	forb	perennial	bog lobelia
Ludwigia palustris	Onagraceae	LUDPAL	native	4	-5	forb	perennial	water-purslane
Lycopus americanus	Lamiaceae	LYCAME	native	2	-5	forb	perennial	common water horehound
Lycopus rubellus	Lamiaceae	LYCRUB	native	8	-5	forb	perennial	stalked water horehound
Lycopus uniflorus	Lamiaceae	LYCUNI	native	2	-5	forb	perennial	northern bugle weed
Lysimachia quadriflora	Myrsinaceae	LYSQUR	native	10	-5	forb	perennial	whorled loosestrife
Lysimachia thysiflora	Myrsinaceae	LYSTHY	native	6	-5	forb	perennial	tufted loosestrife
Maianthemum canadense	Convallariaceae	MAICAN	native	4	3	forb	perennial	canada mayflower
Maianthemum racemosum; smilacina r.	Convallariaceae	MAIRAC	native	5	3	forb	perennial	false spikenard
Maianthemum stellatum; smilacina s.	Convallariaceae	MAISTE	native	5	0	forb	perennial	starry false solomon-seal
Menispermum canadense	Menispermaceae	MENCAE	native	5	0	vine	perennial	moonseed
Mentha Ã—piperita	Lamiaceae	MENPIP	non-native	0	-5	forb	perennial	peppermint
Mitchella repens	Rubiaceae	MITREP	native	5	3	forb	perennial	partridge-berry
Monarda fistulosa	Lamiaceae	MONFIS	native	2	3	forb	perennial	wild-bergamot
Monarda punctata	Lamiaceae	MONPUN	native	4	5	forb	perennial	horse mint
Muhlenbergia mexicana	Poaceae	MUHMEX	native	3	-3	grass	perennial	leafy satin grass
Myrica pensylvanica	Myricaceae	MYRPEA	non-native	0	0	shrub	perennial	bayberry

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Nasturtium officinale	Brassicaceae	NASOFF	native	4	-5	forb	perennial	watercress
Onoclea sensibilis	Onocleaceae	ONOSEN	native	2	-3	fern	perennial	sensitive fern
Osmorhiza claytonii	Apiaceae	OSMCLI	native	4	3	forb	perennial	hairy sweet-cicely
Osmunda cinnamomea	Osmundaceae	OSMCIN	native	5	-3	fern	perennial	cinnamon fern
Osmunda regalis	Osmundaceae	OSMREG	native	5	-5	fern	perennial	royal fern
Oxypolis rigidior	Apiaceae	OXYRIG	native	6	-5	forb	perennial	cowbane
Packera aurea; senecio a.	Asteraceae	PACAUR	native	5	-3	forb	perennial	golden ragwort
Parnassia glauca	Parnassiaceae	PARGLA	native	8	-5	forb	perennial	grass-of-parnassus
Parthenocissus quinquefolia	Vitaceae	PARQUI	native	5	3	vine	perennial	virginia creeper
Pedicularis lanceolata	Orobanchaceae	PEDLAN	native	8	-3	forb	perennial	swamp-betony
Persicaria sagittata; polygonum s.	Polygonaceae	PERSAG	native	5	-5	forb	annual	arrow-leaved tear-thumb
Persicaria virginiana; polygonum v.	Polygonaceae	PERVIR	native	4	0	forb	perennial	jumpseed
Phalaris arundinacea	Poaceae	PHAARU	native	0	-3	grass	perennial	reed canary grass
Phleum pratense	Poaceae	PHLPRA	non-native	0	3	grass	perennial	timothy
Pinus strobus	Pinaceae	PINSTR	native	3	3	tree	perennial	white pine
Pinus sylvestris	Pinaceae	PINSYL	non-native	0	3	tree	perennial	scotch pine
Piptochaetium avenaceum; stipa a.	Poaceae	PIPAVE	native	10	3	grass	perennial	black oatgrass
Platanthera clavellata; habenaria c.	Orchidaceae	PLACLA	native	6	-3	forb	perennial	small green wood orchid
Platanthera psycodes; habenaria p.	Orchidaceae	PLAPSY	native	7	-3	forb	perennial	purple fringed orchid
Poa compressa	Poaceae	POACOM	non-native	0	3	grass	perennial	canada bluegrass
Poa pratensis	Poaceae	POAPRA	non-native	0	3	grass	perennial	kentucky bluegrass
Podophyllum peltatum	Berberidaceae	PODPEL	native	3	3	forb	perennial	may-apple
Polygonatum pubescens	Convallariaceae	POLPUB	native	5	5	forb	perennial	downy solomon seal
Polygonella articulata	Polygonaceae	POLART	native	8	5	forb	annual	jointweed
Populus grandidentata	Salicaceae	POPGRA	native	4	3	tree	perennial	big-tooth aspen
Populus tremuloides	Salicaceae	POPTRE	native	1	0	tree	perennial	quaking aspen
Potentilla simplex	Rosaceae	POTSIM	native	2	3	forb	perennial	old-field cinquefoil
Prunella vulgaris	Lamiaceae	PRUVUL	native	0	0	forb	perennial	self-heal
Prunus serotina	Rosaceae	PRUSER	native	2	3	tree	perennial	wild black cherry
Prunus virginiana	Rosaceae	PRUVIR	native	2	3	shrub	perennial	choke cherry
Pseudognaphalium obtusifolium; gnaphalium o.	Asteraceae	PSEOBT	native	2	5	forb	biennial	old-field balsam
Pteridium aquilinum	Dennstaedtiaceae	PTEAQU	native	0	3	fern	perennial	bracken fern
Pycnanthemum virginianum	Lamiaceae	PYCVIR	native	5	-3	forb	perennial	common mountain mint
Quercus alba	Fagaceae	QUEALB	native	5	3	tree	perennial	white oak

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<i>Quercus macrocarpa</i>	Fagaceae	QUEMAC	native	5	3	tree	perennial	bur oak
<i>Quercus velutina</i>	Fagaceae	QUEVEL	native	6	5	tree	perennial	black oak
<i>Rhamnus alnifolia</i>	Rhamnaceae	RHAALN	native	8	-5	shrub	perennial	alder-leaved buckthorn
<i>Rhus copallina</i>	Anacardiaceae	RHUCOP	native	3	5	shrub	perennial	winged sumac
<i>Rhynchospora alba</i>	Cyperaceae	RHYALB	native	6	-5	sedge	perennial	beak-rush
<i>Ribes hirtellum</i>	Grossulariaceae	RIBHIR	native	6	-3	shrub	perennial	swamp gooseberry
<i>Rosa carolina</i>	Rosaceae	ROSCAR	native	4	3	shrub	perennial	pasture rose
<i>Rosa multiflora</i>	Rosaceae	ROSMUL	non-native	0	3	shrub	perennial	multiflora rose
<i>Rosa palustris</i>	Rosaceae	ROSPAL	native	5	-5	shrub	perennial	swamp rose
<i>Rubus allegheniensis</i>	Rosaceae	RUBALL	native	1	3	shrub	perennial	common blackberry
<i>Rubus flagellaris</i>	Rosaceae	RUBFLA	native	1	3	shrub	perennial	northern dewberry
<i>Rubus hispidus</i>	Rosaceae	RUBHIS	native	4	-3	shrub	perennial	swamp dewberry
<i>Rubus occidentalis</i>	Rosaceae	RUBOCC	native	1	5	shrub	perennial	black raspberry
<i>Rubus pubescens</i>	Rosaceae	RUBPUB	native	4	-3	shrub	perennial	dwarf raspberry
<i>Rubus strigosus</i>	Rosaceae	RUBSTR	native	2	0	shrub	perennial	wild red raspberry
<i>Rudbeckia hirta</i>	Asteraceae	RUDHIR	native	1	3	forb	perennial	black-eyed susan
<i>Rudbeckia laciniata</i>	Asteraceae	RUDLAC	native	6	-3	forb	perennial	cut-leaf coneflower
<i>Rumex acetosella</i>	Polygonaceae	RUMACL	non-native	0	3	forb	perennial	sheep sorrel
<i>Rumex orbiculatus</i>	Polygonaceae	RUMORB	native	9	-5	forb	perennial	great water dock
<i>Salix candida</i>	Salicaceae	SALCAN	native	9	-5	shrub	perennial	hoary willow
<i>Salix discolor</i>	Salicaceae	SALDIS	native	1	-3	shrub	perennial	pussy willow
<i>Sambucus canadensis</i>	Adoxaceae	SAMCAN	native	3	-3	shrub	perennial	elderberry
<i>Sanicula marilandica</i>	Apiaceae	SANMAR	native	4	3	forb	perennial	black snakeroot
<i>Sassafras albidum</i>	Lauraceae	SASALB	native	5	3	tree	perennial	sassafras
<i>Sceptridium oneidense</i>	Ophioglossaceae	SCEONE	native	7	5	fern	perennial	blunt-leaved grape-fern
<i>Schizachyrium scoparium</i> ; <i>andropogon s.</i>	Poaceae	SCHSCO	native	5	3	grass	perennial	little bluestem
<i>Schoenoplectus acutus</i> ; <i>scirpus a.</i>	Cyperaceae	SCHACU	native	5	-5	sedge	perennial	hardstem bulrush
<i>Scirpus cyperinus</i>	Cyperaceae	SCICYP	native	5	-5	sedge	perennial	wool-grass
<i>Scutellaria lateriflora</i>	Lamiaceae	SCULAT	native	5	-5	forb	perennial	mad-dog skullcap
<i>Selaginella eclipes</i>	Selaginellaceae	SELECL	native	5	-3	fern	perennial	selaginella
<i>Sium suave</i>	Apiaceae	SIUSUA	native	5	-5	forb	perennial	water-parsnip
<i>Smilax hispida</i> ; <i>s. tamnoides</i>	Smilacaceae	SMIHIS	native	5	0	vine	perennial	bristly greenbrier
<i>Solanum dulcamara</i>	Solanaceae	SOLDUL	non-native	0	0	vine	perennial	bittersweet nightshade
<i>Solidago caesia</i>	Asteraceae	SOLCAE	native	6	3	forb	perennial	bluestem goldenrod

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Solidago gigantea	Asteraceae	SOLGIG	native	3	-3	forb	perennial	late goldenrod
Solidago patula	Asteraceae	SOLPAT	native	6	-5	forb	perennial	swamp goldenrod
Solidago riddellii	Asteraceae	SOLRID	native	6	-5	forb	perennial	riddells goldenrod
Solidago rugosa	Asteraceae	SOLRUG	native	3	0	forb	perennial	rough-leaved goldenrod
Solidago speciosa	Asteraceae	SOLSPE	native	5	5	forb	perennial	showy goldenrod
Spiraea alba	Rosaceae	SPIALB	native	4	-3	shrub	perennial	meadowsweet
Spiranthes romanzoffiana	Orchidaceae	SPIROM	native	8	-5	forb	perennial	hooded ladies-tresses
Symphotrichum firmum; aster puniceus	Asteraceae	SYMFIR	native	4	-3	forb	perennial	smooth swamp aster
Symphotrichum lanceolatum; aster l.	Asteraceae	SYMLAN	native	2	-3	forb	perennial	panicled aster
Symphotrichum lateriflorum; aster l.	Asteraceae	SYMLAT	native	2	0	forb	perennial	calico aster
Symplocarpus foetidus	Araceae	SYMFOE	native	6	-5	forb	perennial	skunk-cabbage
Thalictrum dasycarpum	Ranunculaceae	THADAS	native	3	-3	forb	perennial	purple meadow-rue
Thelypteris palustris	Thelypteridaceae	THEPAL	native	2	-3	fern	perennial	marsh fern
Toxicodendron radicans	Anacardiaceae	TOXRAD	native	2	0	vine	perennial	poison-ivy
Toxicodendron vernix	Anacardiaceae	TOXVER	native	6	-5	shrub	perennial	poison sumac
Triantha glutinosa; tofieldia g.	Melanthiaceae	TRIGLU	native	10	-5	forb	perennial	false asphodel
Tridens flavus	Poaceae	TRIFLA	native	3	5	grass	perennial	purpletop
Trifolium arvense	Fabaceae	TRIARV	non-native	0	5	forb	annual	rabbitfoot clover
Ulmus americana	Ulmaceae	ULMAME	native	1	-3	tree	perennial	american elm
Ulmus pumila	Ulmaceae	ULMPUM	non-native	0	3	tree	perennial	siberian elm
Vaccinium angustifolium	Ericaceae	VACANG	native	4	3	shrub	perennial	low sweet blueberry
Vaccinium corymbosum	Ericaceae	VACCOR	native	6	-3	shrub	perennial	highbush blueberry
Valeriana uliginosa	Valerianaceae	VALULI	native	10	-5	forb	perennial	swamp valerian
Verbascum thapsus	Scrophulariaceae	VERTHA	non-native	0	5	forb	biennial	common mullein
Viburnum lentago	Adoxaceae	VIBLEN	native	4	0	shrub	perennial	nannyberry
Viburnum opulus	Adoxaceae	VIBOPU	non-native	0	-3	shrub	perennial	european highbush-cranberry
Viola affinis	Violaceae	VIOAFF	native	2	-3	forb	perennial	le contes violet
Viola cucullata	Violaceae	VIOCUC	native	5	-5	forb	perennial	marsh violet
Vitis riparia	Vitaceae	VITRIP	native	3	0	vine	perennial	river-bank grape
Zizia aurea	Apiaceae	ZIZAUR	native	6	0	forb	perennial	golden alexanders



## Appendix 2. Coleman tract uplands

07/27/2016

Barry State Game Area

Barry

MI

USA

FQA DB Region:

Michigan

FQA DB Publication Year:

2014

FQA DB Description:

Reznicek, A.A., M.R. Penskar, B.S. Walters, and B.S. Slaughter. 2014. Michigan Floristic Quality Assessment Database. Herbarium, University of Michigan, Ann Arbor, MI and Michigan Natural Features Inventory, Michigan State University, Lansing, MI. <http://michiganflora.net>

Practitioner:

Brad Slaughter

Latitude:

42.656662

Longitude:

-85.456251

Weather Notes:

Duration Notes:

Community Type Notes:

Dry southern forest, Scots pine plantation, oak barrens, old field

Other Notes:

Conservatism-Based Metrics:

Total Mean C:

3.5

Native Mean C:

4.1

Total FQI:

35.3

Native FQI:

38

Adjusted FQI:

37.6

% C value 0:

17.6

% C value 1-3:

26.5

% C value 4-6:

45.1

% C value 7-10:

10.8

Native Tree Mean C:

3.8

Native Shrub Mean C:

3.9

Native Herbaceous Mean C:	4.2	
Species Richness:		
Total Species:	102	
Native Species:	86	84.30%
Non-native Species:	16	15.70%
Species Wetness:		
Mean Wetness:	3.1	
Native Mean Wetness:	3	
Physiognomy Metrics:		
Tree:	12	11.80%
Shrub:	17	16.70%
Vine:	5	4.90%
Forb:	44	43.10%
Grass:	17	16.70%
Sedge:	5	4.90%
Rush:	0	0%
Fern:	2	2%
Bryophyte:	0	0%
Duration Metrics:		
Annual:	6	5.90%
Perennial:	92	90.20%
Biennial:	4	3.90%
Native Annual:	4	3.90%
Native Perennial:	80	78.40%
Native Biennial:	2	2%

**Species:**

Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
Acer rubrum	Sapindaceae	ACERUB	native	1	0	tree	perennial	red maple
Achillea millefolium	Asteraceae	ACHMIL	native	1	3	forb	perennial	yarrow

<b>Scientific Name</b>	<b>Family</b>	<b>Acronym</b>	<b>Native?</b>	<b>C</b>	<b>W</b>	<b>Physiognomy</b>	<b>Duration</b>	<b>Common Name</b>
<i>Agrimonia gryposepala</i>	Rosaceae	AGRGRY	native	2	3	forb	perennial	tall agrimony
<i>Agrostis hyemalis</i>	Poaceae	AGRHYE	native	4	0	grass	perennial	ticklegrass
<i>Ambrosia artemisiifolia</i>	Asteraceae	AMBART	native	0	3	forb	annual	common ragweed
<i>Amelanchier interior</i>	Rosaceae	AMEINT	native	4	5	shrub	perennial	serviceberry
<i>Amphicarpaea bracteata</i>	Fabaceae	AMPBRA	native	5	0	vine	annual	hog-peanut
<i>Andropogon gerardii</i>	Poaceae	ANDGER	native	5	0	grass	perennial	big bluestem
<i>Apocynum androsaemifolium</i>	Apocynaceae	APOAND	native	3	5	forb	perennial	spreading dogbane
<i>Artemisia campestris</i>	Asteraceae	ARTCAM	native	5	5	forb	biennial	wormwood
<i>Asclepias tuberosa</i>	Apocynaceae	ASCTUB	native	5	5	forb	perennial	butterfly-weed
<i>Berteroa incana</i>	Brassicaceae	BERINC	non-native	0	5	forb	annual	hoary alyssum
<i>Bromus inermis</i>	Poaceae	BROINE	non-native	0	5	grass	perennial	smooth brome
<i>Carex pensylvanica</i>	Cyperaceae	CXPENS	native	4	5	sedge	perennial	sedge
<i>Carex rosea</i> ; c. <i>convoluta</i>	Cyperaceae	CXROSE	native	2	5	sedge	perennial	curly-styled wood sedge
<i>Carex siccata</i> ; c. <i>foenea</i>	Cyperaceae	CXSICC	native	5	5	sedge	perennial	sedge
<i>Carex swanii</i>	Cyperaceae	CXSWAN	native	4	3	sedge	perennial	sedge
<i>Centaurea stoebe</i> ; c. <i>maculosa</i>	Asteraceae	CENSTO	non-native	0	5	forb	biennial	spotted knapweed
<i>Chondrilla juncea</i>	Asteraceae	CHOJUN	non-native	0	5	forb	perennial	skeleton-weed
<i>Circaea canadensis</i> ; c. <i>lutetiana</i>	Onagraceae	CIRCAN	native	2	3	forb	perennial	enchanters-nightshade
<i>Cornus florida</i>	Cornaceae	CORFLO	native	8	3	tree	perennial	flowering dogwood
<i>Cornus foemina</i>	Cornaceae	CORFOE	native	1	0	shrub	perennial	gray dogwood
<i>Corylus americana</i>	Betulaceae	CORAMA	native	5	3	shrub	perennial	hazelnut
<i>Crocianthemum canadense</i> ; <i>helianthemum</i> c.	Cistaceae	CROCAN	native	8	5	forb	perennial	common frostweed
<i>Cyperus lupulinus</i> ; c. <i>filiculmis</i>	Cyperaceae	CYPLUP	native	2	3	sedge	perennial	slender sand sedge
<i>Danthonia spicata</i>	Poaceae	DANSPI	native	4	5	grass	perennial	poverty grass; oatgrass
<i>Dichanthelium columbianum</i> ; <i>panicum</i> c.	Poaceae	DICCOL	native	5	3	grass	perennial	panic grass
<i>Dichanthelium depauperatum</i> ; <i>panicum</i> d.	Poaceae	DICDEP	native	4	5	grass	perennial	panic grass
<i>Dichanthelium dichotomum</i> ; <i>panicum</i> d.	Poaceae	DICDIC	native	7	0	grass	perennial	panic grass
<i>Dichanthelium latifolium</i> ; <i>panicum</i> l.	Poaceae	DICLAT	native	5	3	grass	perennial	broad-leaved panic grass
<i>Digitaria cognata</i> ; <i>leptoloma</i> c.	Poaceae	DIGCOG	native	3	5	grass	perennial	fall witch grass
<i>Elaeagnus umbellata</i>	Elaeagnaceae	ELAUMB	non-native	0	3	shrub	perennial	autumn-olive
<i>Elymus trachycaulus</i> ; <i>agropyron</i> t.	Poaceae	ELYTRA	native	8	3	grass	perennial	slender wheatgrass
<i>Erigeron strigosus</i>	Asteraceae	ERISTR	native	4	3	forb	perennial	daisy fleabane
<i>Euphorbia corollata</i>	Euphorbiaceae	EUPCOR	native	4	5	forb	perennial	flowering spurge

<b>Scientific Name</b>	<b>Family</b>	<b>Acronym</b>	<b>Native?</b>	<b>C</b>	<b>W</b>	<b>Physiognomy</b>	<b>Duration</b>	<b>Common Name</b>
Eurybia macrophylla; aster m.	Asteraceae	EURMAC	native	4	5	forb	perennial	big-leaved aster
Fallopia scandens; polygonum s.	Polygonaceae	FALSCA	native	2	0	vine	perennial	false buckwheat
Festuca subverticillata; f. obtusa	Poaceae	FESSUB	native	5	3	grass	perennial	nodding fescue
Frangula alnus; rhamnus frangula	Rhamnaceae	FRAALN	non-native	0	0	shrub	perennial	glossy buckthorn
Galium circaezans	Rubiaceae	GALCIR	native	4	3	forb	perennial	white wild licorice
Galium pilosum	Rubiaceae	GALPIL	native	6	5	forb	perennial	hairy bedstraw
Galium triflorum	Rubiaceae	GALTRR	native	4	3	forb	perennial	fragrant bedstraw
Gaultheria procumbens	Ericaceae	GAUPRO	native	5	3	shrub	perennial	wintergreen
Gaylussacia baccata	Ericaceae	GAYBAC	native	7	3	shrub	perennial	huckleberry
Goodyera pubescens	Orchidaceae	GOOPUB	native	7	3	forb	perennial	downy rattlesnake plantain
Hieracium gronovii	Asteraceae	HIEGRO	native	5	5	forb	perennial	hairy hawkweed
Hieracium caespitosum	Asteraceae	HIECAE	non-native	0	5	forb	perennial	king devil
Hylodesmum glutinosum; desmodium g.	Fabaceae	HYLGLU	native	5	5	forb	perennial	clustered-leaved tick-trefoil
Hylodesmum nudiflorum; desmodium n.	Fabaceae	HYLNUD	native	7	5	forb	perennial	naked tick-trefoil
Juncus tenuis	Juncaceae	JUNTEN	native	1	0	forb	perennial	path rush
Juniperus virginiana	Cupressaceae	JUNVIR	native	3	3	tree	perennial	red-cedar
Krigia virginica	Asteraceae	KRIVIR	native	4	5	forb	annual	dwarf dandelion
Lechea mucronata; l. villosa	Cistaceae	LECMUC	native	5	5	forb	perennial	hairy pinweed
Lespedeza capitata	Fabaceae	LESCAP	native	5	3	forb	perennial	round-headed bush-clover
Lindera benzoin	Lauraceae	LINBEN	native	7	-3	shrub	perennial	spicebush
Maianthemum canadense	Convallariaceae	MAICAN	native	4	3	forb	perennial	canada mayflower
Maianthemum racemosum; smilacina r.	Convallariaceae	MAIRAC	native	5	3	forb	perennial	false spikenard
Mitchella repens	Rubiaceae	MITREP	native	5	3	forb	perennial	partridge-berry
Monarda punctata	Lamiaceae	MONPUN	native	4	5	forb	perennial	horse mint
Osmorhiza claytonii	Apiaceae	OSMCLI	native	4	3	forb	perennial	hairy sweet-cicely
Parthenocissus quinquefolia	Vitaceae	PARQUI	native	5	3	vine	perennial	virginia creeper
Persicaria virginiana; polygonum v.	Polygonaceae	PERVIR	native	4	0	forb	perennial	jumpseed
Phleum pratense	Poaceae	PHLPRA	non-native	0	3	grass	perennial	timothy
Pinus strobus	Pinaceae	PINSTR	native	3	3	tree	perennial	white pine
Pinus sylvestris	Pinaceae	PINSYL	non-native	0	3	tree	perennial	scotch pine
Piptochaetium avenaceum; stipa a.	Poaceae	PIPAVE	native	10	3	grass	perennial	black oatgrass
Poa compressa	Poaceae	POACOM	non-native	0	3	grass	perennial	canada bluegrass
Poa pratensis	Poaceae	POAPRA	non-native	0	3	grass	perennial	kentucky bluegrass

<b>Scientific Name</b>	<b>Family</b>	<b>Acronym</b>	<b>Native?</b>	<b>C</b>	<b>W</b>	<b>Physiognomy</b>	<b>Duration</b>	<b>Common Name</b>
Podophyllum peltatum	Berberidaceae	PODPEL	native	3	3	forb	perennial	may-apple
Polygonatum pubescens	Convallariaceae	POLPUB	native	5	5	forb	perennial	downy solomon seal
Polygonella articulata	Polygonaceae	POLART	native	8	5	forb	annual	jointweed
Populus grandidentata	Salicaceae	POPGRA	native	4	3	tree	perennial	big-tooth aspen
Populus tremuloides	Salicaceae	POPTRE	native	1	0	tree	perennial	quaking aspen
Potentilla simplex	Rosaceae	POTSIM	native	2	3	forb	perennial	old-field cinquefoil
Prunus serotina	Rosaceae	PRUSER	native	2	3	tree	perennial	wild black cherry
Prunus virginiana	Rosaceae	PRUVIR	native	2	3	shrub	perennial	choke cherry
Pseudognaphalium obtusifolium; gnaphalium o.	Asteraceae	PSEOBT	native	2	5	forb	biennial	old-field balsam
Pteridium aquilinum	Dennstaedtiaceae	PTEAQU	native	0	3	fern	perennial	bracken fern
Quercus alba	Fagaceae	QUEALB	native	5	3	tree	perennial	white oak
Quercus velutina	Fagaceae	QUEVEL	native	6	5	tree	perennial	black oak
Rhus copallina	Anacardiaceae	RHUCOP	native	3	5	shrub	perennial	winged sumac
Rosa carolina	Rosaceae	ROSCAR	native	4	3	shrub	perennial	pasture rose
Rosa multiflora	Rosaceae	ROSMUL	non-native	0	3	shrub	perennial	multiflora rose
Rubus allegheniensis	Rosaceae	RUBALL	native	1	3	shrub	perennial	common blackberry
Rubus flagellaris	Rosaceae	RUBFLA	native	1	3	shrub	perennial	northern dewberry
Rubus hispidus	Rosaceae	RUBHIS	native	4	-3	shrub	perennial	swamp dewberry
Rudbeckia hirta	Asteraceae	RUDHIR	native	1	3	forb	perennial	black-eyed susan
Rumex acetosella	Polygonaceae	RUMACL	non-native	0	3	forb	perennial	sheep sorrel
Sassafras albidum	Lauraceae	SASALB	native	5	3	tree	perennial	sassafras
Sceptridium oneidense	Ophioglossaceae	SCEONE	native	7	5	fern	perennial	blunt-leaved grape-fern
Schizachyrium scoparium; andropogon s.	Poaceae	SCHSCO	native	5	3	grass	perennial	little bluestem
Solidago caesia	Asteraceae	SOLCAE	native	6	3	forb	perennial	bluestem goldenrod
Solidago speciosa	Asteraceae	SOLSPE	native	5	5	forb	perennial	showy goldenrod
Toxicodendron radicans	Anacardiaceae	TOXRAD	native	2	0	vine	perennial	poison-ivy
Tridens flavus	Poaceae	TRIFLA	native	3	5	grass	perennial	purpletop
Trifolium arvense	Fabaceae	TRIARV	non-native	0	5	forb	annual	rabbitfoot clover
Ulmus pumila	Ulmaceae	ULMPUM	non-native	0	3	tree	perennial	siberian elm
Vaccinium angustifolium	Ericaceae	VACANG	native	4	3	shrub	perennial	low sweet blueberry
Vaccinium corymbosum	Ericaceae	VACCOR	native	6	-3	shrub	perennial	highbush blueberry
Verbascum thapsus	Scrophulariaceae	VERTHA	non-native	0	5	forb	biennial	common mullein
Viola affinis	Violaceae	VIOAFF	native	2	-3	forb	perennial	le contes violet

<b>Scientific Name</b>	<b>Family</b>	<b>Acronym</b>	<b>Native?</b>	<b>C</b>	<b>W</b>	<b>Physiognomy</b>	<b>Duration</b>	<b>Common Name</b>
Vitis riparia	Vitaceae	VITRIP	native	3	0	vine	perennial	river-bank grape

### Appendix 3. Coleman tract wetlands

07/27/2016

Barry State Game Area

Barry

MI

USA

FQA DB Region:

Michigan

FQA DB Publication Year:

2014

FQA DB Description:

Reznicek, A.A., M.R. Penskar, B.S. Walters, and B.S. Slaughter. 2014. Michigan Floristic Quality Assessment Database. Herbarium, University of Michigan, Ann Arbor, MI and Michigan Natural Features Inventory, Michigan State University, Lansing, MI. <http://michiganflora.net>

Practitioner:

Brad Slaughter

Latitude:

42.659028

Longitude:

-85.455523

Weather Notes:

Duration Notes:

Community Type Notes:

Southern hardwood swamp, rich tamarack swamp, southern shrub-carr, southern wet meadow, prairie fen, bog  
Also: *Crataegus* sp., *Lemna* sp., *Pilea* sp., *Prenanthes* sp., *Sparganium* sp. *Myrica pensylvanica* is apparently native here.

Other Notes:

Conservatism-Based Metrics:

Total Mean C:

4.5

Native Mean C:

4.7

Total FQI:

57.5

Native FQI:

58.3

Adjusted FQI:

45.7

% C value 0:

7.4

% C value 1-3:

26.4

% C value 4-6:

48.5

% C value 7-10:

17.8

Native Tree Mean C:

3.2

Native Shrub Mean C:

4.8

Native Herbaceous Mean C: 4.8

Species Richness:

Total Species: 163  
Native Species: 154 94.50%  
Non-native Species: 9 5.50%

Species Wetness:

Mean Wetness: -2.1  
Native Mean Wetness: -2.3

Physiognomy Metrics:

Tree: 9 5.50%  
Shrub: 29 17.80%  
Vine: 9 5.50%  
Forb: 74 45.40%  
Grass: 12 7.40%  
Sedge: 20 12.30%  
Rush: 0 0%  
Fern: 10 6.10%  
Bryophyte: 0 0%

Duration Metrics:

Annual: 3 1.80%  
Perennial: 159 97.50%  
Biennial: 1 0.60%  
Native Annual: 3 1.80%  
Native Perennial: 150 92%  
Native Biennial: 1 0.60%

**Species:**

<b>Scientific Name</b>	<b>Family</b>	<b>Acronym</b>	<b>Native?</b>	<b>C</b>	<b>W</b>	<b>Physiognomy</b>	<b>Duration</b>	<b>Common Name</b>
Acer rubrum	Sapindaceae	ACERUB	native	1	0	tree	perennial	red maple
Acer saccharinum	Sapindaceae	ACESAI	native	2	-3	tree	perennial	silver maple



Scientific Name	Family	Acronym	Native?	C	W	Physiognomy	Duration	Common Name
<i>Achillea millefolium</i>	Asteraceae	ACHMIL	native	1	3	forb	perennial	yarrow
<i>Ageratina altissima</i> ; eupatorium rugosum	Asteraceae	AGEALT	native	4	3	forb	perennial	white snakeroot
<i>Agrimonia gryposepala</i>	Rosaceae	AGRGRY	native	2	3	forb	perennial	tall agrimony
<i>Agrostis gigantea</i>	Poaceae	AGRIGG	non-native	0	-3	grass	perennial	redtop
<i>Agrostis hyemalis</i>	Poaceae	AGRHYE	native	4	0	grass	perennial	ticklegrass
<i>Amphicarpaea bracteata</i>	Fabaceae	AMPBRA	native	5	0	vine	annual	hog-peanut
<i>Andropogon gerardii</i>	Poaceae	ANDGER	native	5	0	grass	perennial	big bluestem
<i>Anemone virginiana</i>	Ranunculaceae	ANEVIR	native	3	3	forb	perennial	thimbleweed
<i>Angelica atropurpurea</i>	Apiaceae	ANGATR	native	6	-5	forb	perennial	purplestem angelica
<i>Apocynum cannabinum</i> ; a. sibiricum	Apocynaceae	APOCAN	native	3	0	forb	perennial	indian-hemp
<i>Aralia nudicaulis</i>	Araliaceae	ARANUD	native	5	3	forb	perennial	wild sarsaparilla
<i>Asclepias incarnata</i>	Apocynaceae	ASCINC	native	6	-5	forb	perennial	swamp milkweed
<i>Asclepias syriaca</i>	Apocynaceae	ASCSYR	native	1	5	forb	perennial	common milkweed
<i>Athyrium filix-femina</i>	Athyriaceae	ATHFIL	native	4	0	fern	perennial	lady fern
<i>Berberis thunbergii</i>	Berberidaceae	BERTHU	non-native	0	3	shrub	perennial	japanese barberry
<i>Betula pumila</i>	Betulaceae	BETPUM	native	8	-5	shrub	perennial	bog birch
<i>Boehmeria cylindrica</i>	Urticaceae	BOECYL	native	5	-5	forb	perennial	false nettle
<i>Bromus ciliatus</i>	Poaceae	BROCIL	native	6	-3	grass	perennial	fringed brome
<i>Caltha palustris</i>	Ranunculaceae	CALPAR	native	6	-5	forb	perennial	marsh-marigold
<i>Carex aquatilis</i>	Cyperaceae	CXAQUA	native	7	-5	sedge	perennial	sedge
<i>Carex buxbaumii</i>	Cyperaceae	CXBUXB	native	10	-5	sedge	perennial	sedge
<i>Carex comosa</i>	Cyperaceae	CXCOMO	native	5	-5	sedge	perennial	sedge
<i>Carex cryptolepis</i>	Cyperaceae	CXCRYP	native	8	-5	sedge	perennial	sedge
<i>Carex flava</i>	Cyperaceae	CXFLAV	native	4	-5	sedge	perennial	sedge
<i>Carex hystericina</i>	Cyperaceae	CXHYST	native	2	-5	sedge	perennial	sedge
<i>Carex interior</i>	Cyperaceae	CXINTE	native	3	-5	sedge	perennial	sedge
<i>Carex intumescens</i>	Cyperaceae	CXINTU	native	3	-3	sedge	perennial	sedge
<i>Carex lacustris</i>	Cyperaceae	CXLACU	native	6	-5	sedge	perennial	sedge
<i>Carex leptalea</i>	Cyperaceae	CXLEPA	native	5	-5	sedge	perennial	sedge
<i>Carex stipata</i>	Cyperaceae	CXSTIP	native	1	-5	sedge	perennial	sedge
<i>Carex stricta</i>	Cyperaceae	CXSTRI	native	4	-5	sedge	perennial	sedge
<i>Carex trisperma</i>	Cyperaceae	CXTRIS	native	9	-5	sedge	perennial	sedge
<i>Carex utriculata</i> ; c. rostrata	Cyperaceae	CXUTRI	native	5	-5	sedge	perennial	sedge

<b>Scientific Name</b>	<b>Family</b>	<b>Acronym</b>	<b>Native?</b>	<b>C</b>	<b>W</b>	<b>Physiognomy</b>	<b>Duration</b>	<b>Common Name</b>
<i>Chamaedaphne calyculata</i>	Ericaceae	CHACAL	native	8	-5	shrub	perennial	leatherleaf
<i>Chelone glabra</i>	Plantaginaceae	CHEGLB	native	7	-5	forb	perennial	turtlehead
<i>Cinna arundinacea</i>	Poaceae	CINARU	native	7	-3	grass	perennial	wood reedgrass
<i>Circaea canadensis</i> ; <i>c. lutetiana</i>	Onagraceae	CIRCAN	native	2	3	forb	perennial	enchanters-nightshade
<i>Cirsium muticum</i>	Asteraceae	CIRMUT	native	6	-5	forb	biennial	swamp thistle
<i>Cladium mariscoides</i>	Cyperaceae	CLAMAR	native	10	-5	sedge	perennial	twig-rush
<i>Clematis virginiana</i>	Ranunculaceae	CLEVIR	native	4	0	vine	perennial	virgins bower
<i>Cornus foemina</i>	Cornaceae	CORFOE	native	1	0	shrub	perennial	gray dogwood
<i>Corylus americana</i>	Betulaceae	CORAMA	native	5	3	shrub	perennial	hazelnut
<i>Cryptotaenia canadensis</i>	Apiaceae	CRYCAN	native	2	0	forb	perennial	honestwort
<i>Cypripedium acaule</i>	Orchidaceae	CYPACA	native	5	-3	forb	perennial	pink lady-slipper; moccasin flower
<i>Dasiphora fruticosa</i> ; <i>potentilla</i> f.	Rosaceae	DASFRU	native	8	-3	shrub	perennial	shrubby cinquefoil
<i>Deschampsia cespitosa</i>	Poaceae	DESCES	native	9	-3	grass	perennial	hair grass
<i>Desmodium canadense</i>	Fabaceae	DESCAD	native	3	0	forb	perennial	showy tick-trefoil
<i>Dichanthelium implicatum</i> ; <i>panicum</i> i.	Poaceae	DICIMP	native	3	0	grass	perennial	panic grass
<i>Dioscorea villosa</i> ; <i>dioscorea villosa</i>	Dioscoreaceae	DIOVIL	native	4	0	forb	perennial	wild yam
<i>Doellingeria umbellata</i> ; <i>aster</i> u.	Asteraceae	DOEUMB	native	5	-3	forb	perennial	flat-topped white aster
<i>Drosera rotundifolia</i>	Droseraceae	DROROT	native	6	-5	forb	perennial	round-leaved sundew
<i>Dryopteris carthusiana</i>	Dryopteridaceae	DRYCAR	native	5	-3	fern	perennial	spinulose woodfern
<i>Dryopteris cristata</i>	Dryopteridaceae	DRYCRI	native	6	-5	fern	perennial	crested shield fern
<i>Elaeagnus umbellata</i>	Elaeagnaceae	ELAUMB	non-native	0	3	shrub	perennial	autumn-olive
<i>Eleocharis elliptica</i>	Cyperaceae	ELEELL	native	6	-5	sedge	perennial	golden-seeded spike rush
<i>Eleocharis rostellata</i>	Cyperaceae	ELEROS	native	10	-5	sedge	perennial	spike-rush
<i>Elymus trachycaulus</i> ; <i>agropyron</i> t.	Poaceae	ELYTRA	native	8	3	grass	perennial	slender wheatgrass
<i>Equisetum arvense</i>	Equisetaceae	EQUARV	native	0	0	fern	perennial	common horsetail
<i>Equisetum fluviatile</i>	Equisetaceae	EQUFLU	native	7	-5	fern	perennial	water horsetail
<i>Eupatorium perfoliatum</i>	Asteraceae	EUPPER	native	4	-3	forb	perennial	boneset
<i>Euthamia graminifolia</i>	Asteraceae	EUTGRA	native	3	0	forb	perennial	grass-leaved goldenrod
<i>Eutrochium maculatum</i> ; <i>eupatorium</i> m.	Asteraceae	EUTMAC	native	4	-5	forb	perennial	joe-pye-weed
<i>Frangula alnus</i> ; <i>rhamnus frangula</i>	Rhamnaceae	FRAALN	non-native	0	0	shrub	perennial	glossy buckthorn
<i>Galium triflorum</i>	Rubiaceae	GALTRR	native	4	3	forb	perennial	fragrant bedstraw
<i>Geum canadense</i>	Rosaceae	GEUCAN	native	1	0	forb	perennial	white avens
<i>Glyceria striata</i>	Poaceae	GLYSTR	native	4	-5	grass	perennial	fowl manna grass

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Helianthus giganteus	Asteraceae	HELGIG	native	5	-3	forb	perennial	tall sunflower
Hypericum prolificum	Hypericaceae	HYPPRO	native	5	3	shrub	perennial	shrubby st. johns-wort
Ilex verticillata	Aquifoliaceae	ILEVER	native	5	-3	shrub	perennial	michigan holly
Impatiens capensis	Balsaminaceae	IMPCAP	native	2	-3	forb	annual	spotted touch-me-not
Iris virginica	Iridaceae	IRIVIR	native	5	-5	forb	perennial	southern blue flag
Juncus tenuis	Juncaceae	JUNTEN	native	1	0	forb	perennial	path rush
Juniperus virginiana	Cupressaceae	JUNVIR	native	3	3	tree	perennial	red-cedar
Larix laricina	Pinaceae	LARLAR	native	5	-3	tree	perennial	tamarack
Lathyrus palustris	Fabaceae	LATPAL	native	7	-3	vine	perennial	marsh pea
Leersia oryzoides	Poaceae	LEEORY	native	3	-5	grass	perennial	cut grass
Liatris spicata	Asteraceae	LIASPI	native	8	0	forb	perennial	marsh blazing-star
Lindera benzoin	Lauraceae	LINBEN	native	7	-3	shrub	perennial	spicebush
Liparis loeselii	Orchidaceae	LIPLOE	native	5	-3	forb	perennial	loesels twayblade
Lobelia kalmii	Campanulaceae	LOBKAL	native	10	-5	forb	perennial	bog lobelia
Ludwigia palustris	Onagraceae	LUDPAL	native	4	-5	forb	perennial	water-purslane
Lycopus americanus	Lamiaceae	LYCAME	native	2	-5	forb	perennial	common water horehound
Lycopus rubellus	Lamiaceae	LYCRUB	native	8	-5	forb	perennial	stalked water horehound
Lycopus uniflorus	Lamiaceae	LYCUNI	native	2	-5	forb	perennial	northern bugle weed
Lysimachia quadriflora	Myrsinaceae	LYSQUR	native	10	-5	forb	perennial	whorled loosestrife
Lysimachia thyriflora	Myrsinaceae	LYSTHY	native	6	-5	forb	perennial	tufted loosestrife
Maianthemum canadense	Convallariaceae	MAICAN	native	4	3	forb	perennial	canada mayflower
Maianthemum stellatum; smilacina s.	Convallariaceae	MAISTE	native	5	0	forb	perennial	starry false solomon-seal
Menispermum canadense	Menispermaceae	MENCAE	native	5	0	vine	perennial	moonseed
Mentha —piperita	Lamiaceae	MENPIP	non-native	0	-5	forb	perennial	peppermint
Mitchella repens	Rubiaceae	MITREP	native	5	3	forb	perennial	partridge-berry
Monarda fistulosa	Lamiaceae	MONFIS	native	2	3	forb	perennial	wild-bergamot
Muhlenbergia mexicana	Poaceae	MUHMEX	native	3	-3	grass	perennial	leafy satin grass
Myrica pensylvanica	Myricaceae	MYRPEA	non-native	0	0	shrub	perennial	bayberry
Nasturtium officinale	Brassicaceae	NASOFF	native	4	-5	forb	perennial	watercress
Onoclea sensibilis	Onocleaceae	ONOSEN	native	2	-3	fern	perennial	sensitive fern
Osmunda cinnamomea	Osmundaceae	OSMCIN	native	5	-3	fern	perennial	cinnamon fern
Osmunda regalis	Osmundaceae	OSMREG	native	5	-5	fern	perennial	royal fern
Oxypolis rigidior	Apiaceae	OXYRIG	native	6	-5	forb	perennial	cowbane

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<i>Packera aurea</i> ; <i>senecio</i> a.	Asteraceae	PACAUR	native	5	-3	forb	perennial	golden ragwort
<i>Parnassia glauca</i>	Parnassiaceae	PARGLA	native	8	-5	forb	perennial	grass-of-parnassus
<i>Parthenocissus quinquefolia</i>	Vitaceae	PARQUI	native	5	3	vine	perennial	virginia creeper
<i>Pedicularis lanceolata</i>	Orobanchaceae	PEDLAN	native	8	-3	forb	perennial	swamp-betony
<i>Persicaria sagittata</i> ; <i>polygonum</i> s.	Polygonaceae	PERSAG	native	5	-5	forb	annual	arrow-leaved tear-thumb
<i>Persicaria virginiana</i> ; <i>polygonum</i> v.	Polygonaceae	PERVIR	native	4	0	forb	perennial	jumpseed
<i>Phalaris arundinacea</i>	Poaceae	PHAARU	native	0	-3	grass	perennial	reed canary grass
<i>Platanthera clavellata</i> ; <i>habenaria</i> c.	Orchidaceae	PLACLA	native	6	-3	forb	perennial	small green wood orchid
<i>Platanthera psycodes</i> ; <i>habenaria</i> p.	Orchidaceae	PLAPSY	native	7	-3	forb	perennial	purple fringed orchid
<i>Populus tremuloides</i>	Salicaceae	POPTRE	native	1	0	tree	perennial	quaking aspen
<i>Prunella vulgaris</i>	Lamiaceae	PRUVUL	native	0	0	forb	perennial	self-heal
<i>Pycnanthemum virginianum</i>	Lamiaceae	PYCVIR	native	5	-3	forb	perennial	common mountain mint
<i>Quercus macrocarpa</i>	Fagaceae	QUEMAC	native	5	3	tree	perennial	bur oak
<i>Quercus velutina</i>	Fagaceae	QUEVEL	native	6	5	tree	perennial	black oak
<i>Rhamnus alnifolia</i>	Rhamnaceae	RHAALN	native	8	-5	shrub	perennial	alder-leaved buckthorn
<i>Rhynchospora alba</i>	Cyperaceae	RHYALB	native	6	-5	sedge	perennial	beak-rush
<i>Ribes hirtellum</i>	Grossulariaceae	RIBHIR	native	6	-3	shrub	perennial	swamp gooseberry
<i>Rosa multiflora</i>	Rosaceae	ROSMUL	non-native	0	3	shrub	perennial	multiflora rose
<i>Rosa palustris</i>	Rosaceae	ROSPAL	native	5	-5	shrub	perennial	swamp rose
<i>Rubus allegheniensis</i>	Rosaceae	RUBALL	native	1	3	shrub	perennial	common blackberry
<i>Rubus hispidus</i>	Rosaceae	RUBHIS	native	4	-3	shrub	perennial	swamp dewberry
<i>Rubus occidentalis</i>	Rosaceae	RUBOCC	native	1	5	shrub	perennial	black raspberry
<i>Rubus pubescens</i>	Rosaceae	RUBPUB	native	4	-3	shrub	perennial	dwarf raspberry
<i>Rubus strigosus</i>	Rosaceae	RUBSTR	native	2	0	shrub	perennial	wild red raspberry
<i>Rudbeckia hirta</i>	Asteraceae	RUDHIR	native	1	3	forb	perennial	black-eyed susan
<i>Rudbeckia laciniata</i>	Asteraceae	RUDLAC	native	6	-3	forb	perennial	cut-leaf coneflower
<i>Rumex orbiculatus</i>	Polygonaceae	RUMORB	native	9	-5	forb	perennial	great water dock
<i>Salix candida</i>	Salicaceae	SALCAN	native	9	-5	shrub	perennial	hoary willow
<i>Salix discolor</i>	Salicaceae	SALDIS	native	1	-3	shrub	perennial	pussy willow
<i>Sambucus canadensis</i>	Adoxaceae	SAMCAN	native	3	-3	shrub	perennial	elderberry
<i>Sanicula marilandica</i>	Apiaceae	SANMAR	native	4	3	forb	perennial	black snakeroot
<i>Sassafras albidum</i>	Lauraceae	SASALB	native	5	3	tree	perennial	sassafras
<i>Schoenoplectus acutus</i> ; <i>scirpus</i> a.	Cyperaceae	SCHACU	native	5	-5	sedge	perennial	hardstem bulrush

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Scirpus cyperinus	Cyperaceae	SCICYP	native	5	-5	sedge	perennial	wool-grass
Scutellaria lateriflora	Lamiaceae	SCULAT	native	5	-5	forb	perennial	mad-dog skullcap
Selaginella eclipses	Selaginellaceae	SELECL	native	5	-3	fern	perennial	selaginella
Sium suave	Apiaceae	SIUSUA	native	5	-5	forb	perennial	water-parsnip
Smilax hispida; s. tamnoides	Smilacaceae	SMIHIS	native	5	0	vine	perennial	bristly greenbrier
Solanum dulcamara	Solanaceae	SOLDUL	non-native	0	0	vine	perennial	bittersweet nightshade
Solidago gigantea	Asteraceae	SOLGIG	native	3	-3	forb	perennial	late goldenrod
Solidago patula	Asteraceae	SOLPAT	native	6	-5	forb	perennial	swamp goldenrod
Solidago riddellii	Asteraceae	SOLRID	native	6	-5	forb	perennial	riddells goldenrod
Solidago rugosa	Asteraceae	SOLRUG	native	3	0	forb	perennial	rough-leaved goldenrod
Spiraea alba	Rosaceae	SPIALB	native	4	-3	shrub	perennial	meadowsweet
Spiranthes romanzoffiana	Orchidaceae	SPIROM	native	8	-5	forb	perennial	hooded ladies-tresses
Symphotrichum firmum; aster puniceus	Asteraceae	SYMFIR	native	4	-3	forb	perennial	smooth swamp aster
Symphotrichum lanceolatum; aster l.	Asteraceae	SYMLAN	native	2	-3	forb	perennial	panicked aster
Symphotrichum lateriflorum; aster l.	Asteraceae	SYMLAT	native	2	0	forb	perennial	calico aster
Symplocarpus foetidus	Araceae	SYMFOE	native	6	-5	forb	perennial	skunk-cabbage
Thalictrum dasycarpum	Ranunculaceae	THADAS	native	3	-3	forb	perennial	purple meadow-rue
Thelypteris palustris	Thelypteridaceae	THEPAL	native	2	-3	fern	perennial	marsh fern
Toxicodendron radicans	Anacardiaceae	TOXRAD	native	2	0	vine	perennial	poison-ivy
Toxicodendron vernix	Anacardiaceae	TOXVER	native	6	-5	shrub	perennial	poison sumac
Triantha glutinosa; tofieldia g.	Melanthiaceae	TRIGLU	native	10	-5	forb	perennial	false asphodel
Ulmus americana	Ulmaceae	ULMAME	native	1	-3	tree	perennial	american elm
Vaccinium corymbosum	Ericaceae	VACCOR	native	6	-3	shrub	perennial	highbush blueberry
Valeriana uliginosa	Valerianaceae	VALULI	native	10	-5	forb	perennial	swamp valerian
Viburnum lentago	Adoxaceae	VIBLEN	native	4	0	shrub	perennial	nannyberry
Viburnum opulus	Adoxaceae	VIBOPU	non-native	0	-3	shrub	perennial	european highbush-cranberry
Viola cucullata	Violaceae	VIOCUC	native	5	-5	forb	perennial	marsh violet
Vitis riparia	Vitaceae	VITRIP	native	3	0	vine	perennial	river-bank grape
Zizia aurea	Apiaceae	ZIZAUR	native	6	0	forb	perennial	golden alexanders