2018 Rare Plant Forum

Proposals are listed below in a summary table.

Name	PABS Status	Proposed Status	Proposed by:
Stachys eplingii	***N***	***PX***	**Steve Grund**
Ophioglossum pusillum	***TU***	***PT***	**Steve Grund**
Carex wiegandii	***PT***	***PE***	**Steve Grund**
Prunus angustifolia	***W***	***N***	**Steve Grund**
Opuntia cespitosa	***N***	***PT(PE)***	**Chris Tracey**

Stachys eplingii J.B. Nelson

Current Status in PA Regulations: N
Current PABS Status: N
Proposed Status: PX
Coefficient of Conservatism: 6
Proposed by: Steve Grund, Western Pennsylvania Conservancy/Pennsylvania Natural Heritage Program

Overview

This species has not previously been reported as far north as Pennsylvania. It was discovered while examining specimens identified *as S. palustris* and *S. pilosa* during a successful effort to document *S. arenicola* from Pennsylvania. Known in Pennsylvania from 4 specimens representing 3 localities, the most recent Pennsylvania collection known is from 1950 (CM). This species is probably extant somewhere in Pennsylvania, but as we have no status for Historic, Extirpated is the best fit. One could argue that some time should pass with the species on the radar screens of botanists before proposing that it be given a protected status, but given the small number of specimens, the peripheral position of Pennsylvania in the range of the species, and the global rarity of the species, a good case can be made that this species is not likely to be found to be more common than Threatened, and if an extant population is discovered, it should receive immediate protection standing.

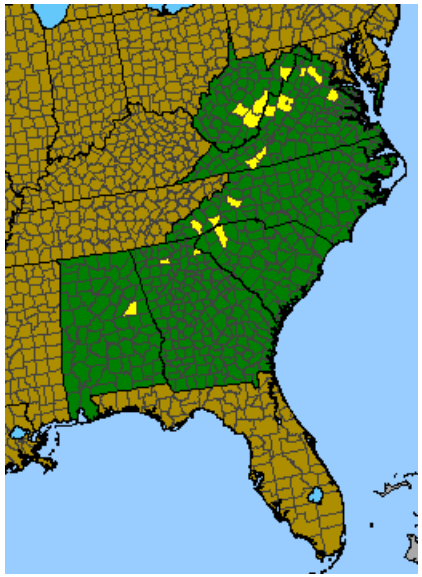
Taxonomy and Identification

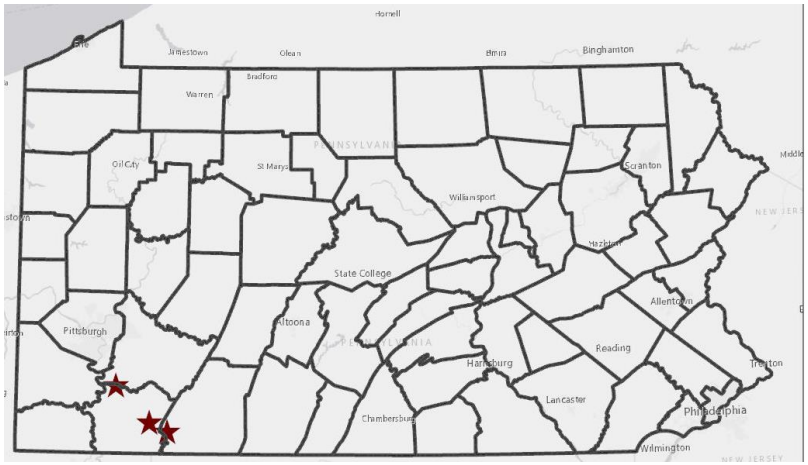
Stachys eplingii was described John Nelson (Nelson and Fairey 1979). The species had been previously confused with *S. nuttallii*, a name that was once misapplied to *S. cordata*, but properly used has never been reported from Pennsylvania; it is confined to the southeastern US. The CM specimens collected in Pennsylvania that have been recently annotated as *S. eplingii* had been previously identified as *S. palustris*. John Nelson has kindly borrowed the specimens and has confirmed the identifications.
Stachys eplingii can be distinguished from *S. palustris* by its less acutely angled calyx lobes and by the presence of tiny glands on the sides of the stem (absent on *S. palustris*). It sometimes has hairs on the angles of the stem, but they are not dense and retrorse as they are for *S. palustris.*

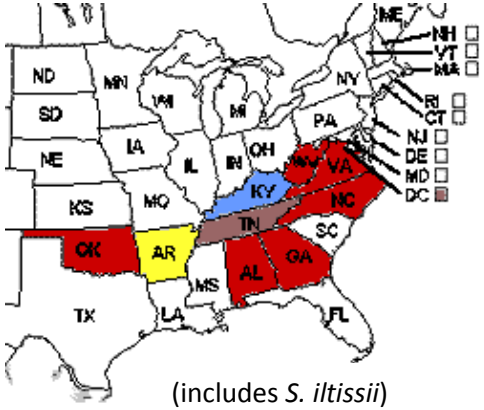
The circumscription of *Stachys eplingii* changed when John Nelson split the Ozark plants into *S. iltisii*, which differs in leaf shape and vestiture, as well as having longer internodes in the infructescence.

Abundance and Distribution in Pennsylvania

Stachys eplingii has been collected four times in Fayette and Somerset Counties. Two of the collections are almost certainly from the same site. The species has been recently documented from Alleghany County, Maryland (John Nelson, pers. comm.). We currently know of no extant populations, but targeted surveys have not yet been conducted. In addition to the historic collection localities and potential habitat in the vicinity of those sites, the species should also be sought in southern tier counties east to Franklin, or possibly Adams, considering the proximity of those counties to Allegany County in Maryland. That said, these recently discovered specimens represent the northern most records of a regional endemic that is S1 in every state from which it is known. The likelihood that this will turn out to be an S3 or more common in Pennsylvania is, in my opinion, very low.







(includes *S. iltissii*)

Stachys eplingii (left, upper and lower) and *Stachys palustris* (right)

Global Abundance and Distribution

The NatureServe global rank of G5 for *S. eplingii* is based on the former, broader circumscription including *S. iltisii*, and is currently being reassessed. The species is ranked S1 in each of the six states from which it is known, so the new G-rank will likely be G1 or G2 (Wes Knapp, Amanda Treher, pers comms).

Native Status in Pennsylvania

The assignment of a CoC of 6 to this species for the Virginia/West Virginia portion of its range indicates that the species is usually but not always found in natural habitats. The Confluence and Ohiopyle specimens are from 1899 and 1905 respectively. The Banning specimens, near the border of Fayette and Westmoreland Counties, were collected in 1950. The occurrences in western Pennsylvania are geographically consistent with a northern extension of the range of the species, which is not known to naturalize outside its natural range (NatureServe 2015, Weakley 2015).

Habitat

Mesic forests, bogs, wet meadows over calcareous or mafic substrates (Weakley 2015).

Conservation Concerns

In addition to being a species of global conservation concern at the northern edge of its range, the calcareous habitat makes it particularly vulnerable to displacement by exotic invasive species, and possibly it has already succumbed to that threat.

Literature Cited

Kartesz, J.T. 2017. Floristic Synthesis of North America, Version 1.0. Biota of North America Program (BONAP). (in press)

NatureServe. 2015. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org. (Accessed: April 4, 2017).

Nelson, J.B. and J.E. Fairey. 1979. Misapplication of the name Stachys nuttallii (Lamiaceae) to a New Southeastern Species. Brittonia 31(4): 491-494.

Weakley, A.S. 2015. Flora of the Southern and Mid-Atlantic States, working draft of 21 May 2015.

Stachys eplingii **Proposed by:** Steve Grund

Current PBS Status: N **Rich forests and wetlands over calcareous or mafic substrates.**

		CATEGORY	COMMENTS
RARITY	**Range Extent**	BC = 100-1000 sq km (~40-400 sq miles)	140 sq km, hedging to include C because of potential additions to the east.
	Area of Occupancy: 4 km2		
	Number of Occurrences	AD = 1 - 300	3 known, all 1950 or earlier.
	Population Size*	ZC = Zero to 1000 individuals	
	Good Viability/Ecological Integrity: # of occurrences	AB = None to very few (0-3) occurrences with good viability	
	Environmental Specificity		
THREATS	**Assigned Overall Threat Impact**	U = Unknown	
TRENDS	**Short-term Trend**	U = Unknown	
	Long-term Trend	U = Unknown	

Calculated Rank **SH**

Assigned Rank** **SH**

Rank Adjustment Reasons

Assigned Rank Reasons Known in Pennsylvania from 4 specimens representing 3 localities. Most recent collection is from 1950. Due to misidentification of specimens, this species had not been reported from Pennsylvania until recently. Calculator updated 19 April 2018 to remove Lehigh record, which does not appear to be S. eplingii.

***Ophioglossum pusillum* Raf.**
Current Status in PA Regulations: N
Current PABS Status: TU (UEF, recommended Watch by DCNR)
Proposed Status: PT
Proposed by: Steve Grund, Western Pennsylvania Conservancy/Pennsylvania Natural Heritage Program

Overview

This species was long confused with *O. vulgatum*, which was once tracked (PX) as a result. We now consider *O. vulgatum* to be secure, largely because most of the specimens once referred to *O. pusillum* have been reassigned to *O. vulgatum*. *O. pusillum* is a species of calcareous to slightly acidic wetlands, and is unsurprisingly much more restricted than its upland congener. This committee determined three years ago that more fieldwork was needed before we were comfortable recommending a status of PE or PT to DCNR, so we went with TU; specifically UEF (Undetermined, likely Endangered, Fieldwork needed). DCNR subsequently determined that they were not comfortable with adding another TU, and decided that the Watch List was a more appropriate status for the species. After three more field seasons, we still have only two known extant locations for this species.

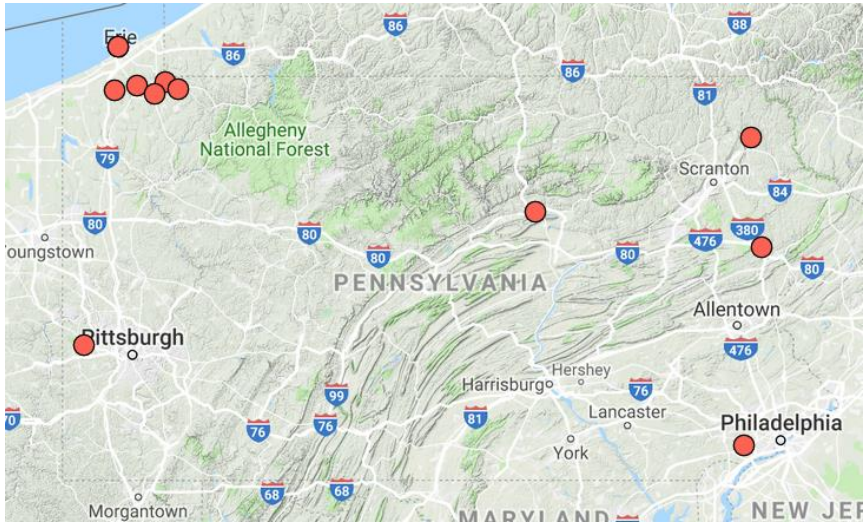
Taxonomy and Identification

Isaac et al (2004) did a nice job of clarifying the identities of the three *Ophioglossum* species known from Pennsylvania. The following key is adapted from that paper. *O. engelmannii*, with an apiculate apex, is excluded for brevity since it is known from only 2 sites in Franklin County.

Frond widest near base and tapering abruptly to the stipe; dark colored leathery persistent sheath present at base of stipe; sporangia oblong and closely crowded. Plants from humus-rich woodland areas	***Ophioglossum vulgatum*** L.
Frond widest near middle, gradually tapering to the base; sheath at base of stipe, if present, membranous and papery; sporangia globular and more widely spaced. Plants from moist mildly acid open areas and meadows	***Ophioglossum pusillum*** Raf.

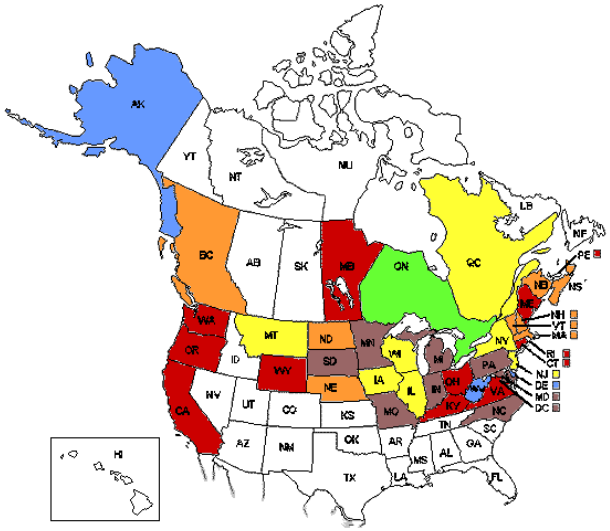
Abundance and Distribution in Pennsylvania

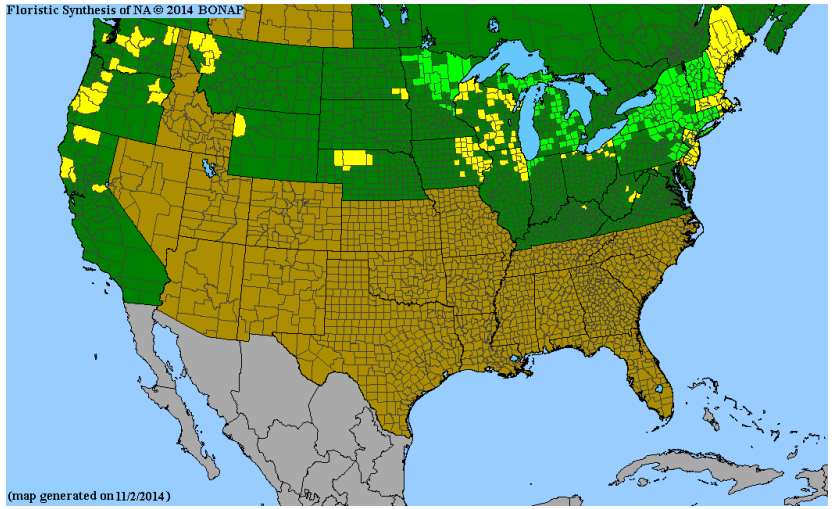
This species has been collected in Pennsylvania only four times from 2 sites since 1965. The total number of specimens is 28. At least 4 of those are essentially duplicates (collected from a single site in a short time frame). Additionally, some of the specimens at PAC and perhaps PH may be misidentified, based on what was found at CM (Isaac et al 2004). The species is easily overlooked, and the actual number of extant sites almost certainly exceeds the documented number. *Ophioglossum* populations, in my experience, tend to be small.



Global Abundance and Distribution

Ophioglossum pusillum is endemic to North America, occurring mostly but not exclusively north of the limit of the Wisconsinan glaciation. It has been assigned a global conservation rank of G5.





Native Status in Pennsylvania

Pennsylvania specimens date back to 1886. This species is not cultivated as far as I know, and I know of no reason to question its native status in Pennsylvania.

Habitat

Open fens, marsh edges, pastures, and grassy shores and roadside ditches, north of the southern boundary of Wisconsin glaciation (Wagner and Wagner, FNA). Moist, mildly acid open areas and meadows (Isaac et al 2004). There is some ambiguity in the literature regarding the pH preference of this species. This may be in part due to the species sometimes occupying raised areas of peat in otherwise alkaline wetlands. Many of the records from NW Pennsylvania are from calcareous fens. I measured a pH of 6.5 at Tamarack Swamp, where the *Ophioglossum* was growing in a transition zone between a fen and a swamp.

Conservation Concerns

Collection history suggests a decline over the past 50 years. Wetland loss and invasive species are two likely causes. A warming climate will likely eliminate the southern fringe of many species over the upcoming decades.

Literature Cited

Isaac, B.L., C.F. Chuey, and J.A. Isaac. 2004. The Genus Ophioglossum in Pennsylvania. Bartonia 62:45-54.

Kartesz, J.T. 2017. Floristic Synthesis of North America, Version 1.0. Biota of North America Program (BONAP). (in press)

NatureServe. 2015. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org. (Accessed: April 4, 2017).

Ophioglossum pusillum **Proposed by:** Steve Grund

Current PBS Status: TU/W **Calcareous fens and similar habitats**

		CATEGORY	COMMENTS
RARITY	**Range Extent**	F = 20,000-200,000 sq km (~8,000-80,000 sq mi)	ca 100,000 sq km, although the species is mostly restricted to glaciated areas.
	Area of Occupancy: 4 km2	**AC = 1-5 4-km2 grid cells**	This is an "A" if only known extant sites are included.
	Number of Occurrences	AB = 1 - 20	2 known extant occurrences. 64 additional herbarium specimens, all at least 50 years old and most much older.
	Population Size*	AB = 1 - 250 individuals	Changing this to AC to allow for the possibility of more than 250 individuals moves it to S2.
	Good Viability/Ecological Integrity: # of occurrences	B = Very few (1-3) occurrences with excellent or good viability or ecological	
	Environmental Specificity	B = Narrow. Specialist or	
THREATS	**Assigned Overall Threat Impact**	C = Medium	
TRENDS	**Short-term Trend**		
	Long-term Trend	AD = Decline of >50%	

Calculated Rank **S1**

Assigned Rank** **S1S2**

Rank Adjustment Reasons

Assigned Rank Reasons There are only two known extant occurrences, and they are quite close together. Fieldwork may result in a significant increase in known occurrences, but the data are sufficient to express confidence that this species is not more secure than S2. The calculated rank of S2 was obtained with the most liberal ranges I could reasonably apply.

***Carex wiegandii* Mack.**

Current Status in PA Regulations: PT

Current PABS Status: PT

Proposed Status: PE

Coefficient of Conservatism: 10

Proposed by: Steve Grund, Western Pennsylvania Conservancy/Pennsylvania Natural Heritage Program

Arthur Haines, Go Botany

Overview

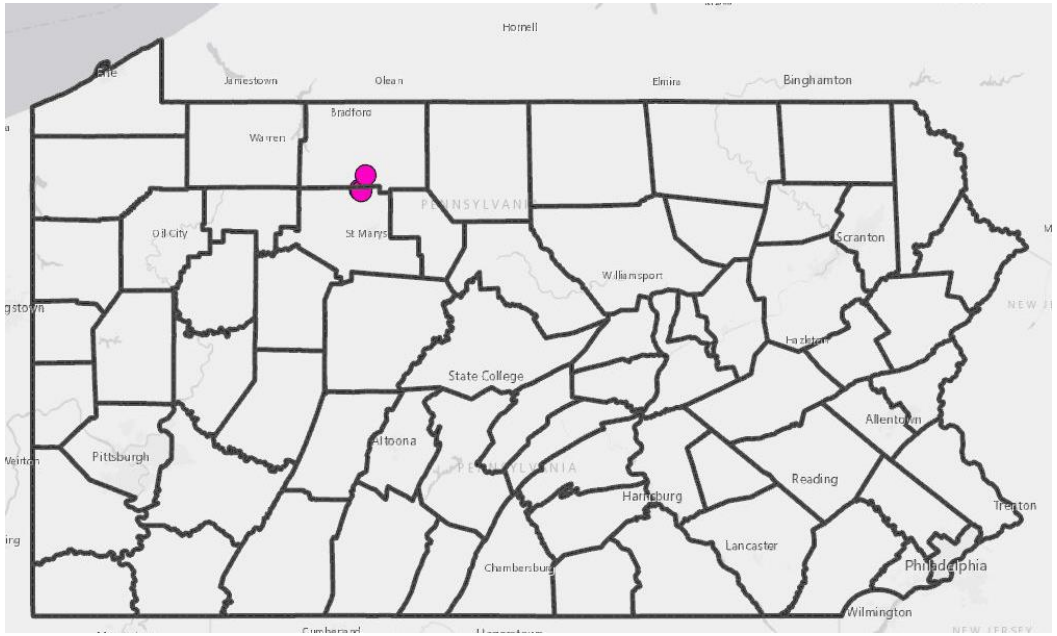
Carex wiegandii is mainly a boreal species. It is known at the southern edge of its range from three sites in Pennsylvania, with just over 8 km between the most distant sites. The Pennsylvania occurrences as a group are about 350 km from the nearest sites in the upper peninsula of Michigan and east of Lake Ontario in New York. Other than Pennsylvania, the most southern station is in Massachusetts. The wetlands of the region are mostly on public land and have been the subject of many botanical surveys; none to my knowledge are similar to the Tsuga/Picea openings where this species is known.

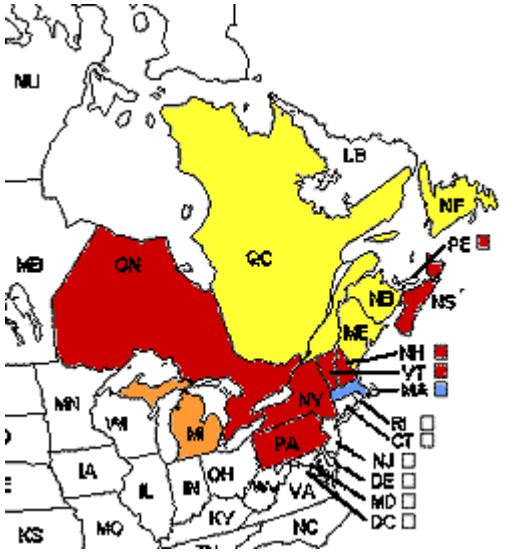
Taxonomy and Identification

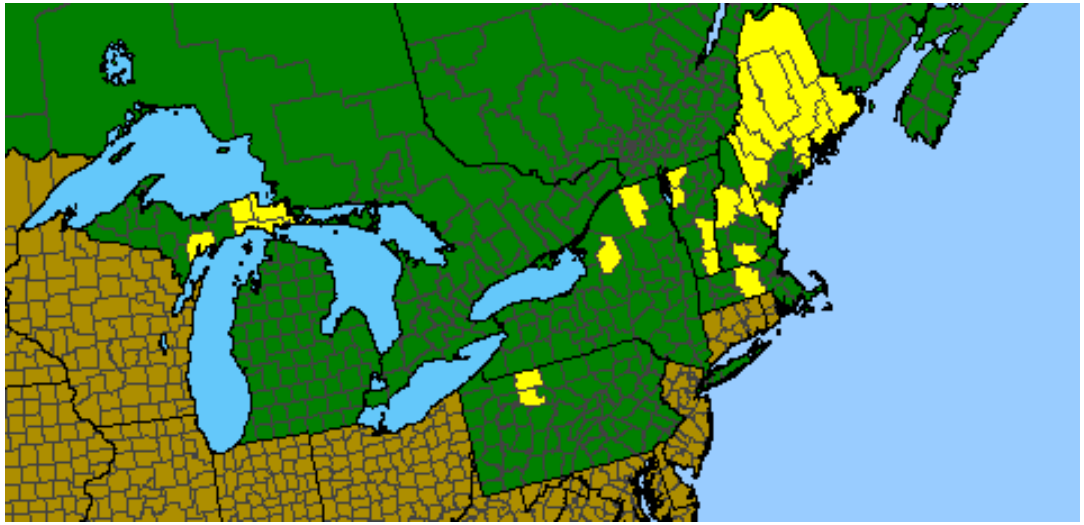
Because of the disjunct nature of the Pennsylvania sites, I asked Tony Reznicek to examine the Pennsylvania specimens in case they might show any sign of being morphologically distinct from plants in the center of the range; Tony was kind enough to undertake the task, and found no differences. *C. wiegandii* is in the Stellulatae; Wide leaves (almost always over 3 mm, very wide for this group) and stout stems make C. wiegandii very easy to distinguish from other members of the Stellulatae.

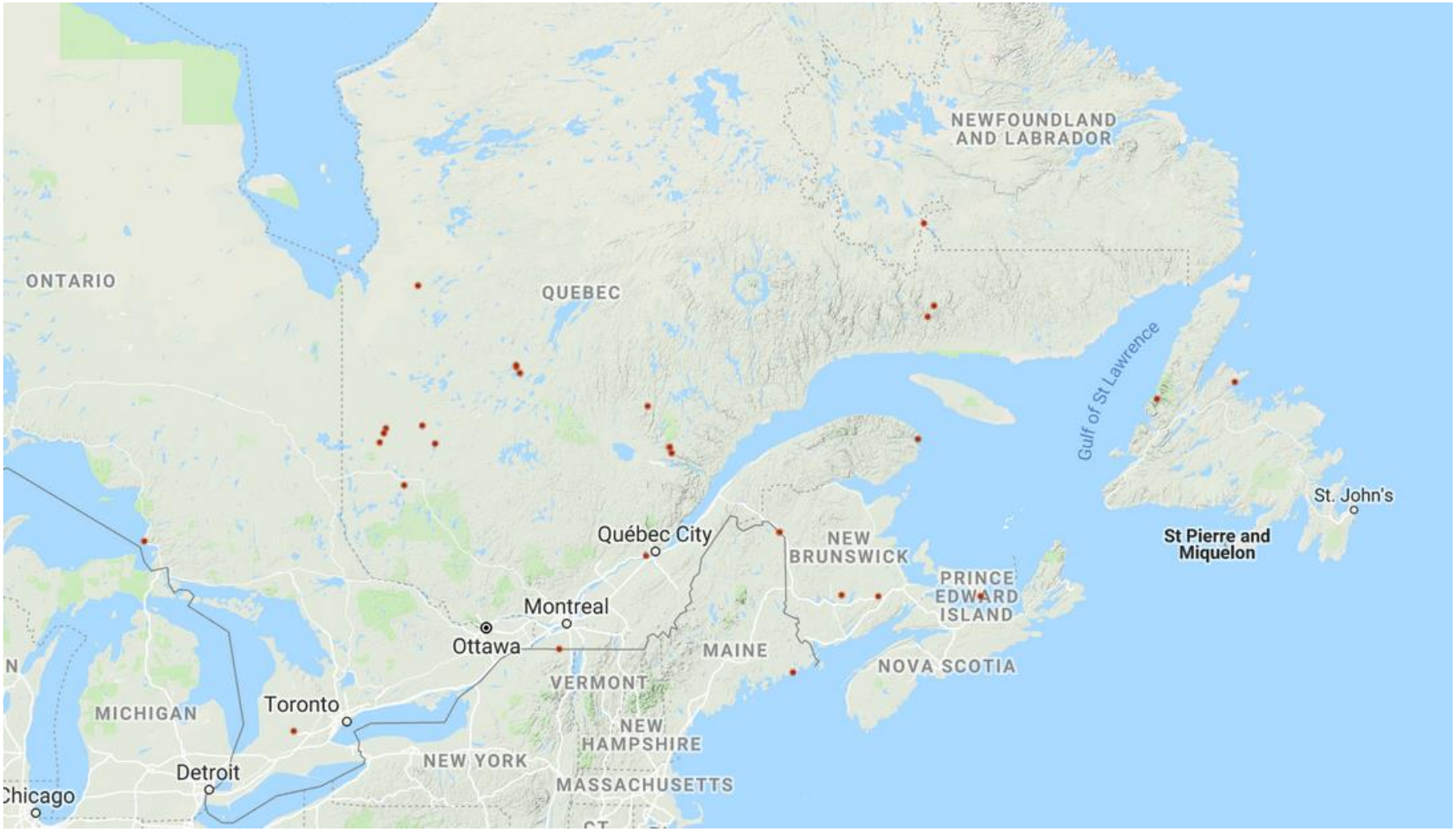
Abundance and Distribution in Pennsylvania

C. wiegandii is quite common in at least part of Catherine Swamp, but the species is confined in Pennsylvania to an area of about 650 ha, in which it occupies 5 or 10 ha at most. No attempts at population number estimates have been made.









Range of Carex wiegandii based on georeferenced specimens in Canadian herbaria (Canadensys, http://data.canadensys.net)

Global Abundance and Distribution

Carex wiegandii is a G4G5 species with a range centered in northern Quebec. It is not known outside of North America, and is not considered to be secure in any state or province, but is ranked S3 in Quebec, Newfoundland, New Brunswick, and Maine.

Native Status in Pennsylvania

The boreal nature and remoteness of the habitats in Pennsylvania leave no significant doubt that the species is native to Pennsylvania. The remarkable fact that this distinctive species was not discovered until 1975 (by Paul Rothrock) is likely attributable to the paucity of botanical surveys conducted in McKean and Elk Counties.

Habitat

At Catherine Swamp, the plants are growing in an acidic peatland with *Tsuga canadensis, Picea rubens, Sphagnum* sp.*, Carex folliculata, Amelanchier bartramiana, Gaultheria hispidula,* and *Carex echinata*.

Conservation Concerns

The most significant threat to the continued viability of *Carex wiegandii* in Pennsylvania is probably climate change. A small increase in summer temperatures could be devastating to a boreal species significantly disjunct southward from the rest of the range of the species.

Literature Cited

Kartesz, J.T. 2017. Floristic Synthesis of North America, Version 1.0. Biota of North America Program (BONAP). (in press)

NatureServe. 2015. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org. (Accessed: April 4, 2017).

Carex wiegandii **Proposed by:** Steve Grund

Current PBS Status: PT **Acidic peatlands.**

		CATEGORY	COMMENTS
RARITY	**Range Extent**	A = <100 sq km (< ~40 sq mi)	7-26 sq km depending on how much of Catherine Swamp is included.
	Area of Occupancy: 4 km2	**A = 1 4-km2 grid cell**	Catherine Swamp, broadly defined, encompasses about 1.5 sq km. Two addional
	Number of Occurrences	A = 1 - 5	
	Population Size*		Three features with no estimates of numbers or area occupied. Number of ramets is probably huge. Number of genets might be small.
	Good Viability/Ecological Integrity: # of occurrences	B = Very few (1-3) occurrences with excellent or good viability or ecological	Both EO's are ranked A
	Environmental Specificity (opt.)	B = Narrow. Specialist or community with key	Acidic wetlands. Usually peatlands, but sometimes in sandy soil (FNA, Michigan Flora, Go Botany).
THREATS	**Assigned Overall Threat Impact**	AB = Very High - High	
TRENDS	**Short-term Trend**	U = Unknown	
	Long-term Trend	AD = Decline of >50%	

Calculated Rank **S1**

Assigned Rank** **S1**

Rank Adjustment Reasons

Assigned Rank Reasons Although the occurrences are large, we have only two, and these are disjunct by 350 km to the south from the nearest known stations. Due to the northern affinity, we have reason to believe that the warming of the climate represents a severe threat to the continued viability of this species in Pennsylvania.

***Prunus angustifolia* Marsh.**
Current Status in PA Regulations: N
Current PABS Status: W (Special Problems list)
Proposed Status: N
Proposed by: Steve Grund, Western Pennsylvania Conservancy/Pennsylvania Natural Heritage Program

Overview
There are very few collections, several are by Ann from the same site. Put in Special Problems because Ann wanted to check specimen ID. The Washington Co record at CM is from Loree in 2006, "roadside of pasture". Habitat is consistent with that provided in FNA (Thickets, upland sandy soil, open woods, sand dunes, fence rows, pastures, roadsides, stream bottoms). Kartesz does show Ohio Co. in WV northern panhandle. It is considered introduced in Ohio, but southern Ohio is near the edge of the core range and nativity may be difficult to assess. Considered to be introduced in Michigan. Weakley says "The original native distribution is unclear; much of its eastern distribution may be the result of early spread by native Americans".

Taxonomy and Identification

Abundance and Distribution in Pennsylvania

Global Abundance and Distribution

Native Status in Pennsylvania

Habitat

Conservation Concerns

Literature Cited
Kartesz, J.T. 2017. Floristic Synthesis of North America, Version 1.0. Biota of North America Program (BONAP). (in press)
NatureServe. 2015. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org. (Accessed: April 4, 2017).

***Opuntia cespitosa* Raf.**
Current Status in PA Regulations: N
Current PABS Status: N
Proposed Status: PT (PE)
Proposed by: Christopher Tracey, Western Pennsylvania Conservancy/Pennsylvania Natural Heritage Program

Overview

This species was originally described by Rafinesque in 1830, but has long been lumped into *O. humifusa* (Majure & Ervin 2008). However, various authors have recognized as a variety (*O. humifusa* var *microsperma* Engelmann, Benson 1962) or species (*O. rafinesquii* Engelm. 1856). Recently, Lucas Majure determined this species to be valid via field, greenhouse, and genetic studies (Majure & Ervin 2008; Majure 2010, 2014; Majure et al. 2017). We became aware of this species over the winter of 2018, noted a possible historic specimen, and subsequently discovered an extant population in the summer of 2017. At least one more population has been field confirmed.

Taxonomy and Identification

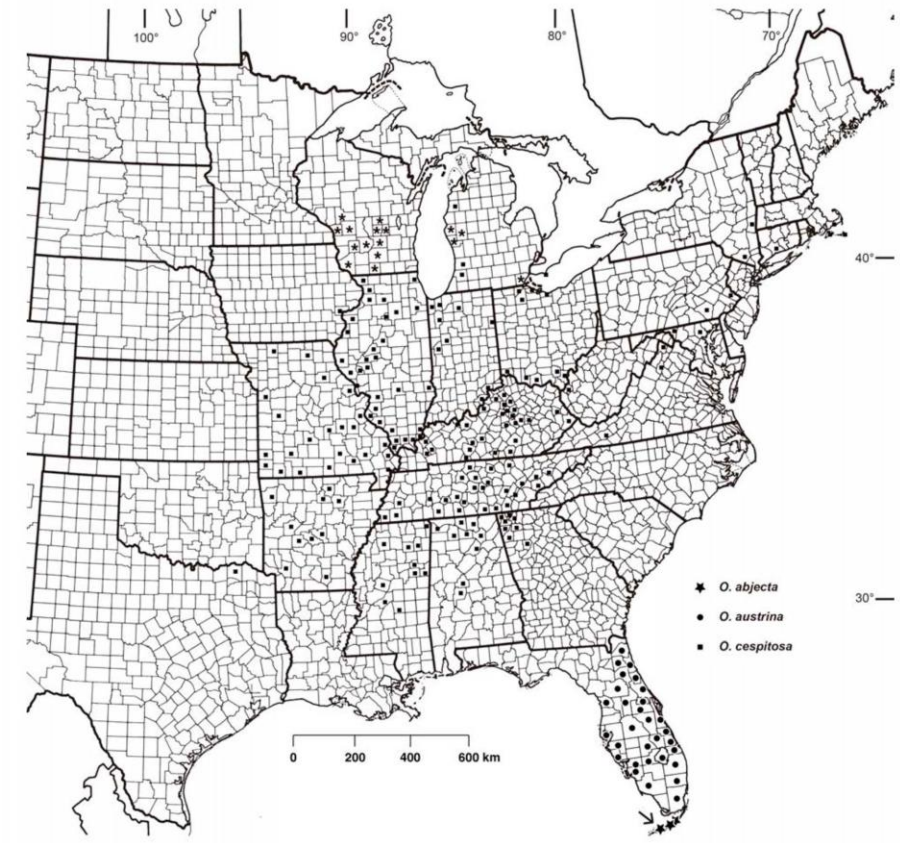
Opuntia cespitosa is a taxon included in the broadly defined *O.* humifusa group (*O.* humifusa s.l.). *O. cespitosa* resembles *O.* humifusa and has long been overlooked by botanists because it was considered synonymous with *O.* humifusa. Characteristics include(Majure & Ervin 2008):

- The cladodes may appear glaucous-gray. They are consistently more orbicular than O. humifusa.
- The most distinguishing feature between *O.* humifusa and *O.cespitosa* is that the latter has yellow tepals with red or maroon bases adaxially.
- It has 0-2 central spines; when there are two spines, both spines are generally in the same plain(i.e., both reflexed or both erect). Spine tips are never retrorsely barbed to the touch, although they do possess microscopic barbs.
- This species typically has crimson, reddish-brown, or dark brown glochids, although plants with light brown glochids are found. They range in length up to 7 mm long and generate the same patterns and varying lengths as those seen in O. humifusa.

Lucas Majure (Biologist of New World Succulents, Desert Botanical Garden) confirmed the specimens via photos on 12/11/2017.

Please note, while the specific epithet for this taxon is often spelled “caespitosa;” Rafinesque, however, first published the name as “cespitosa,” so that spelling is maintained (Majure 2014).

Hybrids are possible.

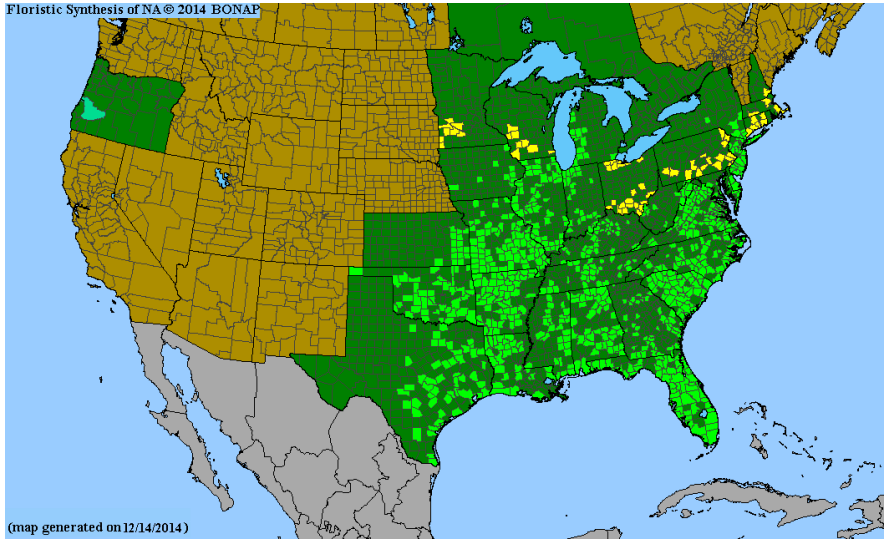


Dot map *of Opuntia cepsitosa* (black squares). (Majure et al. 2017)

Abundance and Distribution in Pennsylvania

Largely a species at the northern edge of its range, our current understanding is as follows:

- 2017 records from: Presque Isle State Park (Erie County) and Delaware Water Gap (Pike County). The Pike County record was a not flowering at the time, but was confirmed by Majure and communications with Rick Koval indicated that he recalled the population having red centered flowers. Two plants were found at PISP while the Delaware Water Gap population likely numbers in the 100s or more.
- There is an 1862 record (Carter s.n. ; CM 255959) originally determined as *O. humifusa* from Mount Johnson Island in the Susquehanna River along Lancaster County. It's been annotated to *O. cespitosa*. Larry Klotz examined slides from a 1987 trip there, no long spines were visible and the plants were in fruit. Visit planned for 2018.
- 1992 specimen from Franklin County (Klotz #1909; SHIP 2063002) along a mowed field.
- Rick Koval may have an additional site in Luzerne County.



BONAP map for *Opuntia humifusa*. BONAP does not currently recognize *O. cespitosa*. Note that Erie and possibly other counties are missing (Kartesz 2017).

Museum records were examined at CM and SHIP as well as through the Mid-Atlantic Herbaria Consortium. Several other known sites were examined through Heritage records, iNaturalist, Flickr, etc and appeared to be *O. humifusa*. All of the shale barren sites in south central Pennsylvania were determined to be *O. humifusa*.

Global Abundance and Distribution

O. cespitosa is found in multiple eastern and Midwestern states including AL, AR, CT, IL, IN, KY, MA, MD, MI, MO, MS, NY, OH, TN, TX, VA and WV. It even occurs in far southern Ontario, Canada (Drezner 2017). The species is currently not in the NatureServe taxonomy.

Native Status in Pennsylvania

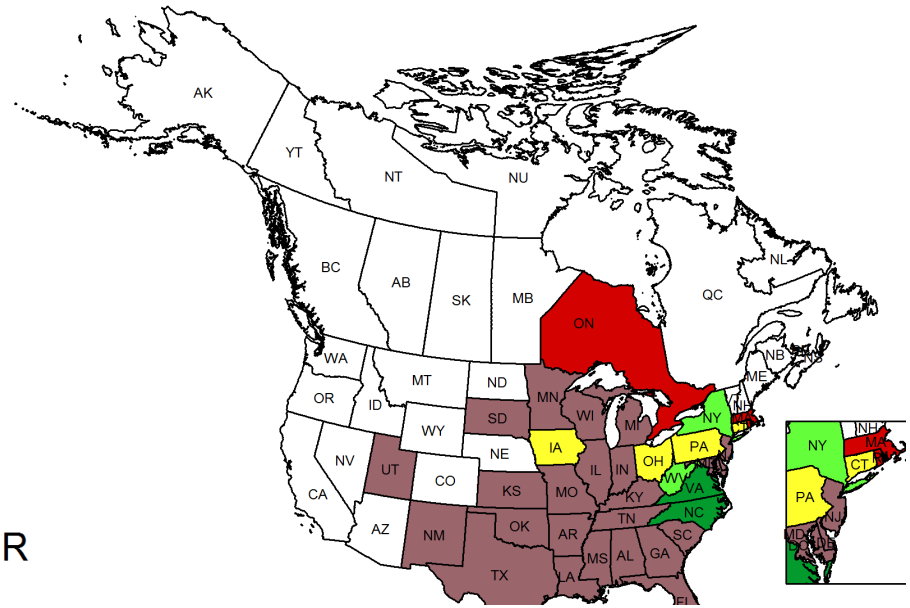
Appears to be native based on available records, examination of the sites, etc.

Habitat

Typically of the genus, the species occurs on dry, open, rocky or sandy ground, such as on shale barrens, slopes, and cliffs. In the southern part of its range it occurs on imestone and chalk outcrops, dolomite outcrops, glades, sandy or blackland prairies, upland hardwood or mixed hardwood-pine forests in dry, clay soils (Majure & Ervin 2008).

Conservation Concerns

Collection pressure, habitat destruction, and degradation.



NatureServe (2015) status map for *Opuntia humifusa*. Note that *O. cespitosa* is not currently in their taxonomy.

Literature Cited

Kartesz, J.T. 2017. Floristic Synthesis of North America, Version 1.0. Biota of North America Program (BONAP). (in press)

NatureServe. 2015. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org. (Accessed: April 4, 2017).

Drezner TD. 2017. North and South: Morphological Variability in the Endangered Opuntia cespitosa in Canada and Variation with Environmental Conditions. Castanea **82**:8–23.

Majure LC. 2010. Towards an Evolutionary Understanding of the Opuntia humifusa Complex of North America. Cactus and Succulent Journal **82**:156–163.

Majure LC. 2014. Typifications and a nomenclatural change in some eastern North American Opuntia (Cactaceae). Phytoneuron **106**:1–2.

Majure LC, Ervin GN. 2008. The Opuntias Of Mississippi. Haseltonia:111–126.

Majure LC, Judd WS, Soltis PS, Soltis DE. 2017. Taxonomic revision of the Opuntia humifusa complex (Opuntieae: Cactaceae) of the eastern United States. Phytotaxa **290**:1–65.

Opuntia on shale bluffs at Delaware Water Gap

Opuntia cespitosa (note long spines)