

Cerastium velutinum var. *villossissimum*

Octoraro Creek Chickweed

Caryophyllaceae



Cerastium velutinum var. *villossissimum* by Jason Hafstad, 2017

Cerastium velutinum var. *villossissimum* Rare Plant Profile

New Jersey Department of Environmental Protection
State Parks, Forests & Historic Sites
Forests & Natural Lands
Office of Natural Lands Management
New Jersey Natural Heritage Program

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December, 2025

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This report should be cited as follows: Johnson, Elizabeth A. 2025. *Cerastium velutinum* var. *villossissimum* Rare Plant Profile. New Jersey Department of Environmental Protection, State Parks, Forests & Historic Sites, Forests & Natural Lands, Office of Natural Lands Management, New Jersey Natural Heritage Program, Trenton, NJ. 16 pp.

Life History

Octoraro Creek Chickweed (*Cerastium velutinum* var. *villosissimum*) is a perennial herbaceous member of the Caryophyllaceae. Although little detailed descriptive information was found for this variety, the overall characteristics are likely similar to those of *C. velutinum*. The flowering stems of *C. velutinum* grow up to 40 cm in height with sterile stems growing only 5–15(–20) cm. While the stems can be erect, they are more often sprawling from the base and sometimes form wide mats. Stems are branched, with numerous glandular and nonglandular hairs. The leaves are opposite, sessile, simple and entire, and likely of similar size as leaves of *C. velutinum*, which are 2–4.5(–6.5) cm long. Morton (2020) described the leaves of var. *villosissimum* as broadly lanceolate to ovate, densely white-villous, with a blunt tip. They can be so numerous on sterile stems that they obscure the stem; leaves are also often marcescent, remaining on the stem through the winter once they've dried and withered. Those leaf characteristics help distinguish var. *villosissimum* from the more common *C. velutinum* var. *velutinum*, which has leaves that are narrower and not as villous, do not obscure the stem, and are not marcescent (Gustafson et al. 2003; Missouri Plants 2025; Morton 2020).



Francis W. Pennell, 1929.



Jason Hafstad, 2017.

Octoraro Chickweed blooms from May through August (Weakley et al. 2025). The flowers are similar to those of *C. velutinum*, which grow in loose panicles of 5–20 flowers, each bloom about 10 mm wide with five white petals and five sepals. The petals are two times as long as the sepals and deeply split into two lobes. The fruits of *C. velutinum* are cylindrical capsules 10–14 mm long that contain small brown seeds 0.8–1.2 mm wide, each with a tuberculate surface. In addition, *C. velutinum* (and likely Octoraro Creek Chickweed) has a taproot and may produce short rhizomes (Morton 2020; Missouri Plants 2025).

Pollinator Dynamics

The flowers of *Cerastium* species are insect pollinated with many species also able to self-pollinate. For example, Field Chickweed (*C. arvense strictum*) is pollinated by bees such as little carpenter bees (*Ceratina* spp.), cuckoo bees (*Nomada* spp.), mason bees (*Osmia* spp.), Halictid bees (*Lasioglossum* spp.), and Andrenid bees (*Andrena* spp.) (Hilty 2020) and it does self-pollinate. Because of its close relationship to *C. arvense*, it is likely that Octoraro Creek Chickweed is pollinated by similar species and may also self-pollinate. Although outcrossing introduces genetic diversity into a population, when pollinators are scarce, self-pollination can offer assurance for seed production.

Seed Dispersal

Cerastium velutinum (and likely var. *villosissimum*) produces small reddish-brown seeds in capsule-shaped fruits that mature in mid-to-late summer. When dried, tiny teeth-like valves at one end of the capsule split apart to release the seeds. Those seeds either fall to the ground to germinate near the parent plant or may be spread by small animals that eat them.

Although no records were found in the literature specifically for *Cerastium* chickweeds, the seeds of related Common Chickweed (*Stellaria media*) are reported to be eaten by the Deer Mouse (*Peromyscus maniculatus*), Meadow Jumping Mouse (*Zapus hudsonius*), and House Mouse (*Mus musculus*) in the eastern United States, and Thirteen-lined Ground Squirrel (*Ictidomys tridecemlineatus*) in the midwestern prairies. The Field Sparrow (*Spizella pusilla*) and probably other granivorous songbirds also eat the seeds occasionally (see Hilty 2020 and references therein). Similarly, Martin et al. (1951) only mentioned *Stellaria media* as the chickweed that was most important to wildlife as a food plant; Common Chickweed produces many seeds and has tender leaves that are browsed by White-tailed Deer (*Odocoileus virginianus*). While *Stellaria* seeds are a bit larger, given the similarities in seed type between *Stellaria media* and *Cerastium arvense* (SIG 2025), it is likely that *Cerastium* species are also eaten and spread by many of the same mammal and bird species.

Regarding seed germination requirements, Baskin and Baskin (2002) looked at the germination phenology and requirements for a number of temperate species. For Nodding Chickweed (*C. nutans*), an annual species, seeds required a physiological dormancy, and they used a pre-planting treatment consisting of warm stratification with germination occurring under a 73/54 °F temperature cycle. Germination was greater in light than in dark. For the mat-forming perennial Bering Chickweed (*C. beerlingianum*), an alpine species, germination occurred at 64 °F. For *C. arvense*, Drake and Ewing (n.d.) found that seed stratification was not necessary for germination and the greatest germination rates occurred at higher temperatures (65–70 °F at night). There is much variability in germination requirements among *Cerastium* species with no detailed seed germination guidance found for var. *villosissimum*.

Information regarding seed longevity or viability in *Cerastium* species was sparse and focused on cultivated or weedy species. The seeds of Mouse-ear Chickweed (*C. holosteoides*), for example, were reported to remain viable up to 68 years in the soil (SIG 2025 and references

therein). As previously mentioned, in addition to dispersal by seed, *Cerastium velutinum* may spread vegetatively via small rhizomes (Morton 2020).

Habitat

Octoraro Creek Chickweed has been considered endemic to Cecil County, Maryland and Chester County, Pennsylvania (the single serpentine endemic in the Eastern United States), only found on serpentine outcrops or in grassy seepage areas in serpentine barrens (Gustafson et al. 2003; Morton 2004; Rajakaruna et al. 2009; Weakley et al. 2025). Serpentine soils are typically characterized as thin and rocky, with an abundance of heavy metals (e.g., chromium, iron, nickel, magnesium), and are nutrient poor—especially lacking in nitrogen and calcium. The extreme nature of those soils is a challenging environment for most plants with only certain, often rare, species adapting to the site conditions. Historically, grazing and natural fires helped maintain the open habitat; now prescribed fire is used as a management tool in some serpentine barrens to expose mineral soil and slow plant succession (Latham 1993). Octoraro Creek Chickweed has a heliophily rating of 9, implying that it requires open habitats with either no canopy, or an open or savanna canopy, with an exposure of at least 50% of sky (Weakley et al. 2025). It is found growing between 100–300 m (300–1000 ft) elevation (Morton 2020).

The two New Jersey populations are an exception as the plants in those populations are not found in serpentine soils; instead, they are found in thin soils above sandstone and quartzite bedrock. One population grows in cold, sphagnous seepage areas on the lower southeast facing slope of Kittatinny Mountain in Sussex County and along an open feeder stream and swamp edge. The other population, originally found in 1920 in “dry, rocky, pastured open woods” at one end of a pond, was observed during a 2014 site visit (almost 100 years later!) on a seepage slope along a feeder stream to the pond. Associated species at that location included Tufted Hair Grass (*Deschampsia caespitosa*) and Lyre-Leaf Rockcress (*Arabidopsis lyrata*). A third historical population was found in 1919 in damp mossy rocks at the base of the Kittatinny Mountains (NJNHP 2024). Those seepages are part of a rare inland acidic wetland complex that also supports the endemic Hammond’s Yellow Spring Beauty (*Claytonia virginica* var. *hammondiae*). For more details on the rare wetland complex see the Hammond’s Yellow Spring Beauty rare plant profile.

For comparison, Weakley et al. (2025) and Morton (2020) described optimal habitat for populations of the closely related native *Cerastium velutinum* var. *velutinum* in the southeastern United States as being rocky river scour, dry limestone bluffs, woodlands, and other open areas. That species has a heliophily rating of 7, indicating that it strongly prefers sunnier locations but can tolerate shadier conditions. According to David Snyder (personal communication 2025) New Jersey also has occurrences of *C. velutinum* var. *velutinum*, with records from Bergen, Hunterdon, Mercer, Sussex, and Warren counties, although most of those are historical. He described typical habitat for this subspecies in New Jersey along the Delaware River as rocky outcrops that range from dry to seasonally wet, and rarely wet seepage slopes.

Most flowering plants have associations with mycorrhizal fungi to assist with nutrient and water uptake for growth and reproduction. Wang and Qiu (2006) conducted a literature review of

papers reporting on plant-mycorrhizal associations and found that of the ten species and subspecies of *Cerastium* reviewed six had populations that were nonmycorrhizal (*C. alpinum*, *C. arcticum*, *C. cerastoides*, *C. glomeratum*, *C. holosteoides* var. *hallaisanense*, and *C. semidecandrum*), one had an association with arbuscular mycorrhizal fungi (AM) (*C. fontanum* ssp. *fontanum*), and three had both mycorrhizal (AM) and nonmycorrhizal populations (*C. arvense*, *C. fontanum*, *C. fontanum* ssp. *glabrescens*). There is a likelihood that at least some of the Octoraro Creek Chickweed populations are mycorrhizal.

Wetland Indicator Status

The U. S. Army Corps of Engineers (2022) does not provide a wetland status for a taxonomic unit that can be clearly identified as *Cerastium velutinum* var. *villosissimum* but Weakley et al. (2025) indicate that it is a facultative upland species, meaning that it usually occurs in nonwetlands but may occur in wetlands.

USDA Plants Code (USDA, NRCS 2025)

The USDA does not currently provide a code for *Cerastium velutinum* var. *villosissimum*. The code for the synonym they utilize, *Cerastium arvense* ssp. *velutinum* var. *villosum*, is CEARV4.

Coefficient of Conservancy (Walz et al. 2020)

CoC = 7. Criteria for a value of 6 to 8: Native with a narrow range of ecological tolerances and typically associated with a stable community (Faber-Langendoen 2018).

Distribution and Range

The global range of *Cerastium velutinum* var. *villosissimum* is restricted to a few locations in Pennsylvania, Maryland, and New Jersey (Kartesz 2015; Morton 2020; POWO 2025). The map in Figure 1 depicts the known extent of the variety. In New Jersey it has only been reported in Sussex County.

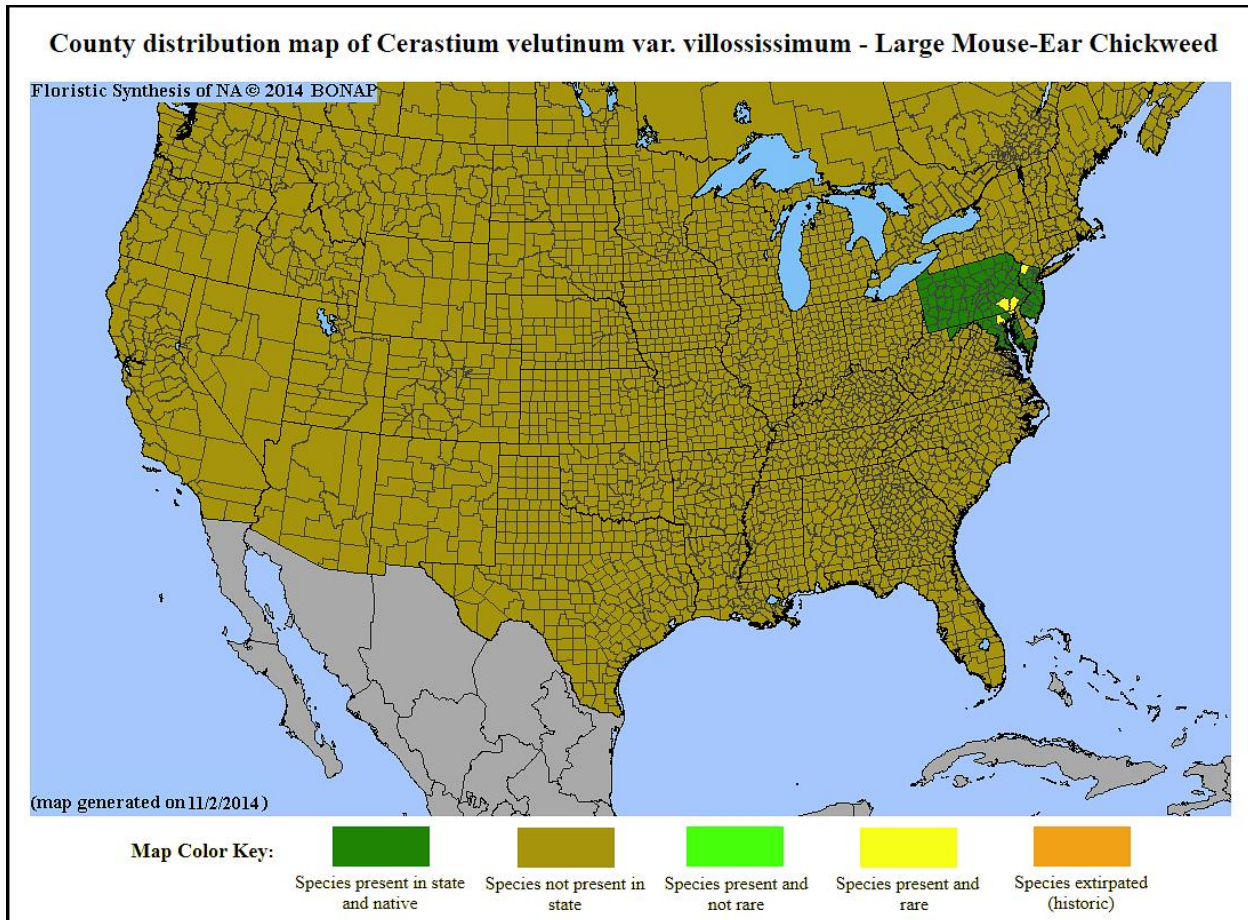


Figure 1. Distribution of *C. velutinum* var. *villossissimum*, adapted from BONAP (Kartesz 2015).

Conservation Status

Cerastium velutinum var. *villossissimum* is critically imperiled globally. The G5T1 rank means the variety is at very high risk of extinction or collapse due to a very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors (NatureServe 2025). The map below (Figure 2) illustrates the conservation status of Octoraro Creek Chickweed throughout its range. It is ranked as critically imperiled in all of the states where it has been reported.

The variety has also been identified as a plant species of highest conservation priority for the North Atlantic region, which includes four Canadian provinces and twelve U. S. states. The chickweed has a rank of R1 (critically imperiled), signifying a very high risk of regional extinction (Frances 2017).

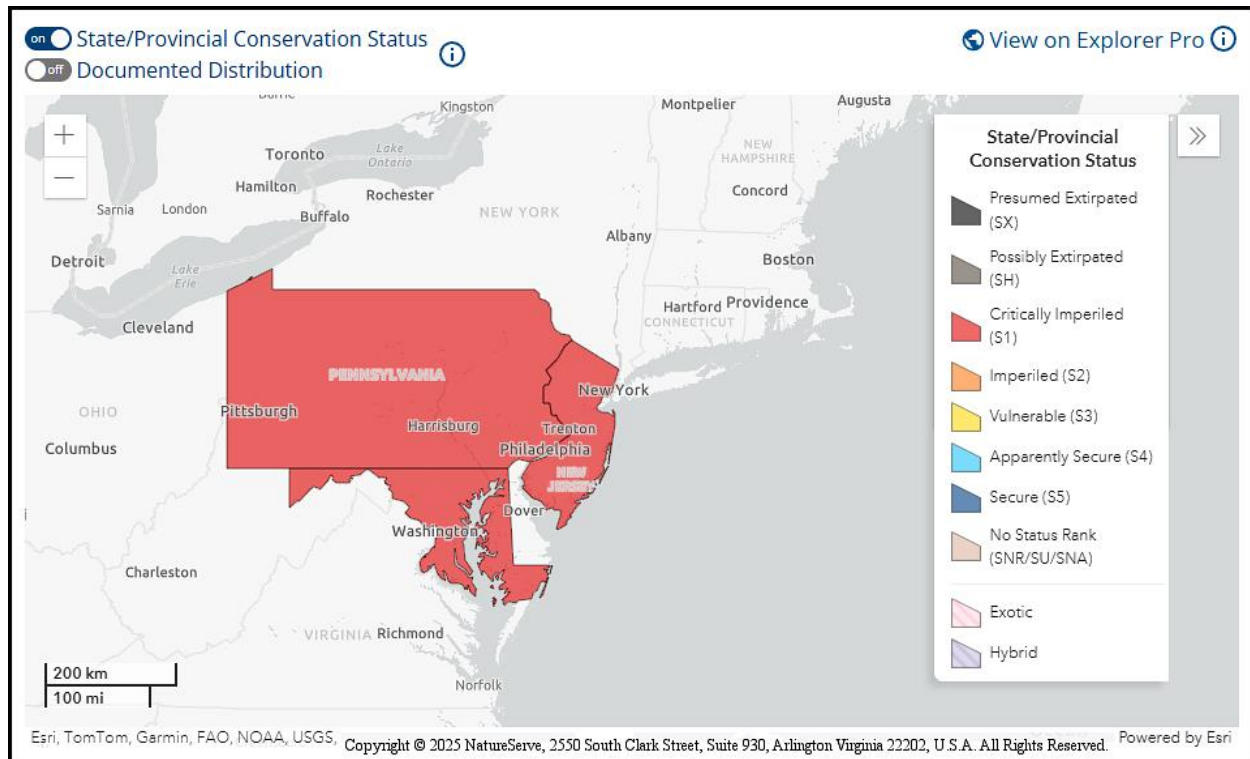


Figure 2. Conservation status of *C. velutinum* var. *villosissimum* (NatureServe 2025).

Cerastium velutinum var. *villosissimum* is critically imperiled (S1) in New Jersey (NJNHP 2024). The rank signifies five or fewer occurrences in the state. A species with an S1 rank is typically either restricted to specialized habitats, geographically limited to a small area of the state, or significantly reduced in number from its previous status. Octoraro Creek Chickweed has also been assigned a regional status code of HL, signifying that the variety is eligible for protection under the jurisdiction of the Highlands Preservation Area (NJNHP 2010). New Jersey has three occurrences, two extant and one historical (last observed in 1919) and preserved as a specimen (NJNHP 2024).

Threats

There are only two extant populations of Octoraro Creek Chickweed in New Jersey, both found in open areas in the same rare inland acidic seepage community as Hammond's Yellow Spring Beauty. One of the main threats to those *Cerastium* populations are habitat succession and the encroachment of invasive plant species that could overshadow the site, potentially reducing flowering and seed production in the sun-loving plants. Any disruption to the existing hydrologic regime, whether changes to precipitation patterns, altered stream and seep flow, or flooding from upslope runoff is another major threat to those populations. Over the course of a year, beaver (*Castor canadensis*) activity completely flooded one *Cerastium* subpopulation (NJNHP 2024).

Human activity on site or on adjacent properties is another threat to the species. During site visits in 2014, it was noted that runoff containing pollutants from adjacent road maintenance might negatively affect the site. Forest management on adjacent properties may also threaten any plants

that are downslope of the tree harvesting, due to resulting erosion and runoff. Also of concern is plant poaching, something that was mentioned in the observations from a 2020 site visit where it was noted that there were several holes along the meadow edge from which plants may have been removed (NJNHP 2024). In addition to site trampling, human access would increase the potential for non-native species encroachment into the population via seed transmission, with negative effects on habitat integrity.

Some cultivated *Cerastium* species such as Snow-in-Summer (*Cerastium tomentosum*) are considered somewhat “resistant” to White-tailed Deer (*Odocoileus virginianus*) herbivory (North Carolina Cooperative Extension 2025), ostensibly due to the presence of highly pubescent leaves. However, herbivory is always a potential threat when deer numbers are at high densities as they are in New Jersey. Insect herbivory of flowers and seeds is also a possible threat to var. *villosissimum* as related *C. arvense* var. *strictum* and other *Cerastium* species are eaten by moth larvae of *Haematopis grataria* (Chickweed Geometer) (Hilty 2020), which occurs in New Jersey.

To date, there has been no evidence of any serious diseases affecting *Cerastium* in the wild; however, there are some fungal diseases that affect cultivated species (e.g., Snow-in-Summer and Mouse-ear Chickweed) such as root rot, powdery mildew, and rusts (North Carolina Cooperative Extension 2025). Due to the genetic isolation of the Octoraro Creek Chickweed populations, there may be future challenges regarding population health and longevity. The genetics of the New Jersey taxon is currently under review, with implications for the long-term management of those populations.

Climate Change Vulnerability

Information from the references cited in this profile was used to evaluate the vulnerability of New Jersey's *Cerastium velutinum* var. *villosissimum* population to climate change. The species was assigned a rank from NatureServe's Climate Change Vulnerability Index using the associated tool (Version 3.02) to estimate its exposure, sensitivity, and adaptive capacity to changing climatic conditions in accordance with the guidelines described by Young et al. (2016) and the state climatic computations by Ring et al. (2013). Based on available data, Octoraro Creek Chickweed was assessed as Extremely Vulnerable, meaning that climate change is expected to “substantially decrease or disappear” from New Jersey by 2050. This conclusion was reached with very high confidence, based on the facts that there are only two extant populations in New Jersey, apparently dependent on a specific hydrologic regime, and with limited dispersal capacity. In addition, many site- and variety-specific knowledge gaps remain.

New Jersey is the fastest warming state in the Northeast and third fastest in the country (Howard 2024). Climate change in New Jersey is also projected to lead to altered precipitation patterns with summer droughts becoming more common (Hill et al. 2020). Those warmer temperatures and altered precipitation patterns are likely to affect hydrologic conditions and may change the timing of the annual groundwater recharge cycle with potential disruptions to spring flow (Pallis et al. 2022). Although considered a facultative upland species (Weakley et al. 2025), the two extant New Jersey populations appear to rely on a specific hydrologic regime to maintain the seepage community, which may be drastically affected by the changing climate. There is no information about germination requirements for var. *villosissimum*, including optimal seed

germination temperature or the need for seed stratification. It is quite possible that future climatic conditions may become less suitable for seed germination.

Although non-native invasive plant species were not noted during the most recent site visits, they represent a significant potential threat to the populations of var. *villosissimum*. As the climate continues to warm, the spread of such species into New Jersey is likely to increase. Salva and Bradley (2023) identified more than a dozen new range-shifting species that could have significant detrimental impacts on New Jersey's plant communities by 2050. Bellard et al. (2013) identified the northeastern United States as a probable hotspot for new invasions by non-native flora, and other evaluations have projected that some exotic plants that have already gained a foothold in the region are likely to become more abundant (Coville et al. 2021; O'Uhuru 2022). The encroachment of non-native plants could further reduce habitat suitability if any of those species become established in the vicinity of the *C. velutinum* var. *villosissimum* population, especially if that site becomes drier in future years.

Management Summary and Recommendations

The current New Jersey populations of Octoraro Creek Chickweed are found on protected land. However, a revisit to both occurrences is a priority, since it has been five to ten years since the last site visits. Habitat changes can occur quickly, especially when it comes to beaver activity, the influx of non-native species, or deer herbivory. Due to the global rarity of this variety, regular monitoring of the populations to detect new threats and address any existing threats is critical. It may be possible to combine monitoring site visits with those for the *Claytonia virginica* var. *hammondiae* with which it co-occurs, as they share most of the same threats.

Although the populations are on protected land, it is still important to work with adjacent landowners (e.g., the National Park Service) to help ensure that any management actions taken on those adjoining properties do not jeopardize the Octoraro Creek Chickweed occurrence, for example, by impeding onsite water flow or causing upslope erosion on steeper slopes. Monitoring of forest management planning and harvest on adjacent lands would also help reduce any potential negative impacts of forest cutting activity in or near the *Cerastium* populations (NJNHP 2024).

Likewise, regular monitoring of non-native invasive species would help detect invasions before they become problematic, although none have been noted to date. Because the species has a high heliophily rating, habitat succession or competition with non-native invasive species will be a challenge and maintaining the open nature of the habitat is critical to population persistence (Weakley et al. 2025). Any invasive species control should be implemented with care to not affect the *Cerastium velutinum* var. *villosissimum* plants directly by trampling or the application of toxic chemicals or indirectly through hydrologic alterations such as soil compaction and subsequent ponding. Beaver activity in an adjacent woodland swamp resulted in the flooding of one var. *villosissimum* subpopulation (NJNHP 2024). Future beaver activity in proximity to other subpopulations should be monitored, with dam or animal removal considered. Public access to the site should be managed to minimize trampling and influx of invasive species seeds. While herbivory has not been noted to date onsite, regular monitoring will help ensure that protective actions can be taken should deer or other browsers start to become a problem.

Many information gaps exist in relation to *Cerastium* life history and habitat requirements. Genetic assessment is underway to determine whether the New Jersey populations represent a unique taxon (see Synonyms and Taxonomy section). Basic plant identification descriptions are also lacking for this variety. Other potential research questions include: What is known about germination requirements, seed viability, and seed bank longevity? What animal species disperse the seeds of var. *villosissimum*? In addition to animal seed dispersal, can seeds spread by the flowing seepage water in the wetland populations? Are there any specialist pollinators? Although known in some other *Cerastium* species, are there any mycorrhizal associations for this particular taxon? Hammond's Yellow Spring Beauty, with which var. *villosissimum* co-occurs, is highly dependent on the qualities of the rare inland acidic seep community. How dependent is *C. velutinum* var. *villosissimum* on site hydrology and the particular water chemistry and other acidic seepage characteristics?

Synonyms and Taxonomy

The current accepted botanical name of the species is *Cerastium velutinum* var. *villosissimum* (Pennell) J. K. Morton. Orthographic variants, synonyms, and common names are listed below (Center for Plant Conservation 2020; ITIS 2025; Lookingbill et al. 2007; Morton 2020; POWO 2025). All synonyms are based on the original description by Pennell (1931). Octoraro Creek Chickweed is currently recognized as *Cerastium arvense* var. *villosum* by NatureServe (2025) and listed under *Cerastium arvense* ssp. *velutinum* var. *villosum* by the USDA, NRCS (2025). Morton elevated the status of *Cerastium velutinum* to the species level in part due to morphological character differences vs. *C. arvense* as well as the difference in chromosome number (*velutinum* is tetraploid vs. diploid) and they are not interfertile (Morton 2020). (Note: Many *Cerastium* species exhibit polyploidy; it is a means of speciation in certain habitats.)

There is still some question as to whether the New Jersey populations are the same species/variety as the serpentine barrens endemic, although plants from both locations share numerous morphological characteristics (Snyder, personal communication 2025). The following is a brief history of the ongoing quest for taxonomic clarity about the New Jersey occurrences of the Octoraro Creek Chickweed, based on correspondences with David Snyder and Christopher Hoess.

According to David Snyder, "The first New Jersey collection was made by L. Griscom on 5 July 1919 (s.n. NY). Griscom called it "*C. ?velutinum*." Two additional collections were made by K. K. Mackenzie (s.n. NY PH) and L. Griscom (9675 GH, NY) on their joint trip to Sussex County on 11 July 1920. Mackenzie labeled his specimens "*Cerastium biebersteini*" and Griscom labeled his as "*Cerastium*." In 2004, G. K. Morton annotated both these NY specimens: "*Cerastium* indet. and not *biebersteinii* or *villosissimum*. Almost certainly a garden escape." He did not annotate Griscom's duplicate at GH, which is filed as "*C. arvense*.""

Morton's 2004 Flora of North America treatment included New Jersey in var. *villosissimum*'s range with no source cited. (However, he did not include New Jersey in his papers on *villosissimum* for his 2003 Bulletin of the Torrey Botanical Club or his 200[4] Sida papers.) The first modern report for New Jersey is Kalmbacker's 1970 paper on *Claytonia hammondiae* where the *Cerastium* was called "*Cerastium beeringianum*," clearly misidentified as it is native to the

Western United States and Canada. In 2012, Snyder did a thorough study of the plant, confirming it as a perennial and determined that the closest fit was var. *villosissimum*, at least based on what taxa have been so far described in the literature.

In 2022, Chris Hoess collected five specimens of the *Cerastium* from the New Jersey site for DNA analysis. Preliminary results confirmed that the New Jersey species was not *C. arcticum*, nor a garden escape (*C. biebersteinii* or *C. tomentosum*), but something in the *C. arvense* complex. It also does not appear to be *C. elongatum* Pursh (= *C. arvense* subsp. *strictum* Gaudin of Flora of North America [FNA]). Instead, it is an allopolyploid similar to *C. arvense* (non-native) or *C. velutinum* (native). For now, Hoess (personal communication 2025) suggested that it be described simply as a variety of *C. velutinum*, he does not believe it is the same as *C. velutinum* var. *villosissimum*. However, he has additional DNA analyses pending that will hopefully help to resolve the taxonomic status of this plant. Stay tuned!

Botanical Synonyms

Common Names

<i>Cerastium velutinum</i> var. <i>villosissimum</i> (Pennell) J. K. Morton	Octoraro Creek Chickweed
<i>Cerastium arvense</i> var. <i>villosissimum</i> Pennell	Long-haired Barrens Chickweed
<i>Cerastium arvense</i> var. <i>villosum</i> (Muhl. ex Darl.) Hollick & Britt.	Goat Hill Chickweed
<i>Cerastium arvense</i> L. ssp. <i>velutinum</i> (Raf.) Ugborgho	
var. <i>villosum</i> (Muhl. ex Darl.) Hollick & Britton	

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