

# *Symphotrichum ericoides* var. *ericoides*

White Heath Aster

Asteraceae



*Symphotrichum ericoides* var. *ericoides* by William Van Hemessen, 2023

## *Symphotrichum ericoides* var. *ericoides* 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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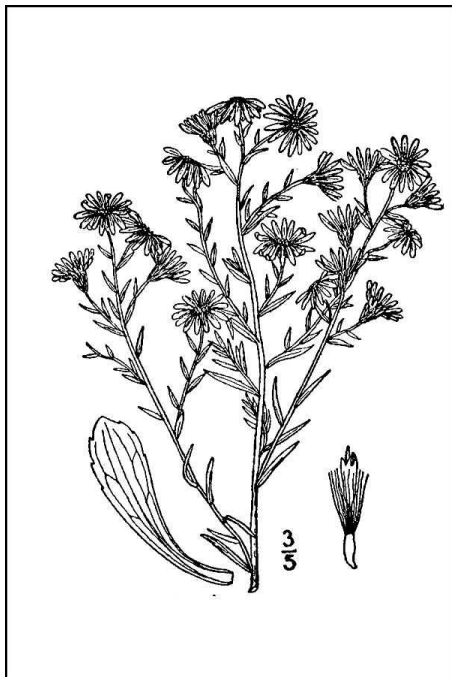
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## Life History

*Symphotrichum ericoides* var. *ericoides* (White Heath Aster) is a perennial herb in the Asteraceae. It is a rhizomatous, often colonial plant that can form dense mounds (Brouillet et al. 2020; Gleason and Cronquist 1963). The main stem, which grows 30–91cm in height, is decumbent to erect and strigose (hairy) with the hairs mostly adpressed or closely ascending. The numerous heath-like leaves are simple, alternate, and sessile with lower stem leaves up to 6 cm x 7 mm in size. The lower leaves often wither and fall off before flowering begins (Hilty 2020; Minnesota Wildflowers 2024). Upper stem leaves are 10 x 4 mm, linear, oblong, and spine-tipped (Chmielewski and Semple 2003; Gleason and Cronquist 1963; North Carolina Extension 2024; Semple 2014). Much like a heath plant, White Heath Aster has a bushy, grayish appearance (LBJWC 2023).

The many small daisy-like flowers are densely clustered on slightly recurved or divergent branches (Gleason and Cronquist 1963). The involucre is cylindro-campanulate, 3–5 mm, with strongly imbricate bracts, many of which may be coarsely ciliolate-margined and usually shortly hairy on the back. The yellow tubular disk flowers, which turn reddish or brownish with age, are surrounded by 8–20 white (rarely pink or blue) rays, 3–5 mm in length. Jones (1978) observed 20–25 florets per head in *S. ericoides*. White Heath Aster blooms from mid-July (-August) to October (-November), depending on location (Brouillet et al. 2020; Chmielewski and Semple 2003; Gleason and Cronquist 1963; Minnesota Wildflowers 2024; Native Plant Trust 2020; LBJWC 2023).



Left: Britton and Brown 1913, courtesy USDA NRCS 2024a. Right: Courtesy R. W. Smith, Lady Bird Johnson Wildflower Center.

White Heath Aster can resemble White Oldfield American-Aster (*S. pilosum*) but *S. ericoides* var. *ericoides* flowers are smaller with leaves and stems that are less pubescent. In addition, the

phyllaries of *Symphyotrichum ericoides* are spine-tipped when compared to those of *S. pilosum*. *S. ericoides* also has been known to hybridize with New England Aster (*S. novae-angliae*) (Chmielewski and Semple 2003; Gleason and Cronquist 1963).

The seeds of White Heath Aster are spindle-shaped cypselas (1.0 x 0.4 x 0.2 mm), tapered at each end with ribbed margins, each surface nerved and covered with dense stiff adpressed hairs. The single pappus whorl is 3–4 mm long (about the same length as the disc corolla) (Brouillet et al. 2020; Chmielewski and Semple 2003).

### **Pollinator Dynamics**

Perennial asters require cross pollination by insects for reproduction. *S. ericoides* is considered an obligate out-crosser, with individual flower heads being receptive to pollen for five to six days on average (Jones 1978). According to Wetmore and Delisle (1939 in Chmielewski and Semple 2003) all morphological forms of *S. ericoides* produce viable pollen (85%). Considered an important native bee plant by the Xerces Society (LBJWC 2023), White Heath Aster is visited by many pollinators, the most important being long-tongued bees (e.g., Apidae, Anthophoridae, and Megachilidae) and short-tongued bees (e.g., Halictidae, Colletidae, and Andrenidae). Seven specialist bees also visit the flowers of *Symphyotrichum* in the Aster family in the Mid-Atlantic (Fowler 2016) though it is not known how important *S. ericoides* var. *ericoides* is to those bee species and whether all species occur in New Jersey. While most pollinator activity occurs at dawn and dusk pollination can occur throughout the day. The flower rays typically close around the disc florets at night (Jones 1978).

Other reported invertebrate visitors include wasps (e.g., Sphecidae, Vespidae, Pompilidae, and Ichneumonidae), flies (e.g., Syrphidae, Bombyliidae, Tachinidae, Sarcophagidae, and Muscidae), butterflies and moths (e.g., Pieridae), and beetles (e.g., Cantharidae and Chrysomelidae) (Hilty 2020 and references therein). Many invertebrate species rely on the nectar from the plant, which is reported to contain relatively high amino acid concentrations along with sugars (Wixted 2017).

### **Seed Dispersal**

The seeds of White Heath Aster mature in the fall (September), but only 20–30% of the potential seeds on any given flower head typically mature (Jones 1978). Ripe seeds separate from the receptacles and are carried by the wind with the help of a seed's pappus. The pappi are sensitive to humidity and only activate under optimal dispersal conditions; however, dispersal distances are not known (Jones 1978; LBJWC 2023). After dispersal, seed germination under natural conditions is reported to be low (Jones 1978) and seeds may require stratification. The seeds of some aster species are reported to remain viable in the seed bank for at least four years, with a decline in germination rates each year. It is not known how long *S. ericoides* var. *ericoides* seeds are viable (Jones 1978). Vegetatively, *S. ericoides* var. *ericoides* spreads easily via stoloniferous rhizomes; Leck and Leck (1998) documented regeneration from rhizome fragments in the old fields they studied in New Jersey. Jones (1978) observed that mesic prairie conditions supported

the development of extensive colonies while drier conditions resulted in the formation of smaller, individual clumps connected by their underground rhizomes.

Under cultivation, White Heath Aster can be propagated by seed or division. To propagate by seeds, the seeds should be dried, cleaned, and stored in sealed containers at 3–5° C (40° F). Seeds can be sown indoors after damp stratifying at 1–2 °C for 2.5–4 months (alternatively, LBJWC [2023] recommends dry stratification). For germination in the following spring, seeds should be sown in an unheated greenhouse or outside before the last frost. Fall or mid-winter sowing outdoors is best in covered containers, cold frames, or unheated greenhouses. Germination occurs within two weeks under suitable conditions (Wennerberg 2004).

Apart from seeding, rhizomes can be divided into several pieces, each containing buds and roots. Divisions are best made in late summer for transplanting in the fall (September to November) or potted and stored under outdoor temperature conditions (with insulation if needed) for transplanting the following spring (mid-April to mid-June) (Wennerberg 2004). The White Heath Aster is not cormoid and does not produce bulblets.

### **Habitat**

White Heath Aster can be found in a variety of habitats as its range is quite extensive. It is a sun obligate (Weakley et al. 2024), found in open (sunny to semi-sunny), dry to moist, well drained sandy, gravelly, rocky, or disturbed soils. Once established, the plant is somewhat drought-tolerant (North Carolina Extension 2024). Typical habitats include prairies, limestone glades and other open calcareous situations, dunes, shores, pastures, fields, and along railroad rights-of-way (ROWs) and roadsides (Brouillet et al. 2020; Deam 1940; LBJWC 2023; Native Plant Trust 2024; Southwest Desert Flora 2022; Weakley et al. 2024). In Virginia, it is found growing over mafic rocks such as diabase and metabasalt (Virginia Botanical Associates 2024) and has been found at elevations from 30 to 2200 meters, range wide (Brouillet et al. 2020).

Most land plant species, including many Asteraceae, have mycorrhizal associations that aid them in nutrient uptake (Wang and Qiu 2006). In a study of the mycorrhizae of prairie plants of North America, Dhillon and Friese (1992) noted that *Symphyotrichum ericoides* had a moderately strong association with arbuscular mycorrhizae.

### **Wetland Indicator Status**

The U. S. Army Corps of Engineers divided the country into a number of regions for use with the National Wetlands Plant List and portions of New Jersey fall into three different regions (Figure 1). *Symphyotrichum ericoides* has more than one wetland indicator status within the state. In the Atlantic and Gulf Coastal Plain region, *S. ericoides* is an upland species, meaning that it almost never occurs in wetlands. In other parts of the state the aster is a facultative upland species, meaning that it usually occurs in nonwetlands but may occur in wetlands (U. S. Army Corps of Engineers 2020).

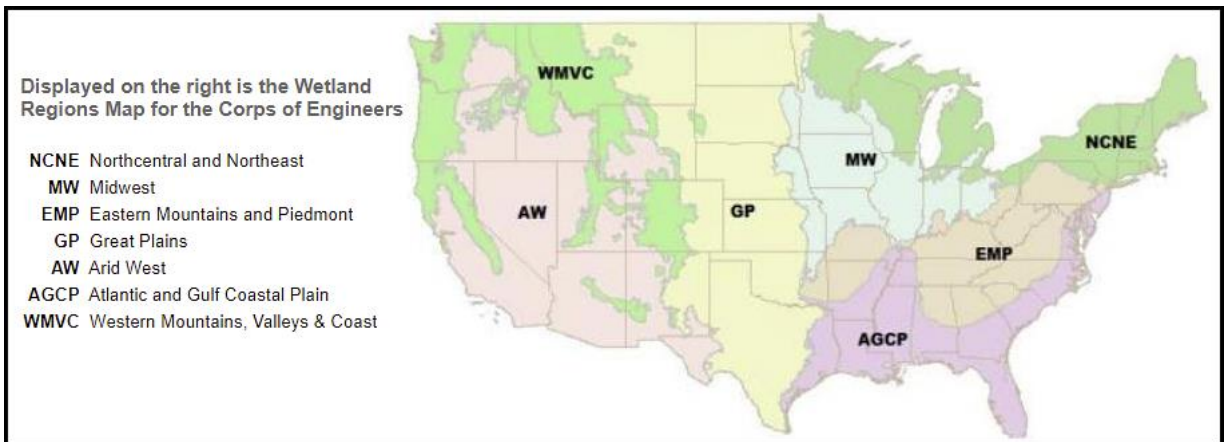


Figure 1. Mainland U. S. wetland regions, adapted from U. S. Army Corps of Engineers (2020).

### **USDA Plants Code (USDA, NRCS 2024b)**

SYERE

### **Coefficient of Conservancy (Walz et al. 2020)**

CoC = 9. Criteria for a value of 9 to 10: Native with a narrow range of ecological tolerances, high fidelity to particular habitat conditions, and sensitive to anthropogenic disturbance (Faber-Langendoen 2018).

### **Distribution and Range**

*Symphyotrichum ericoides* var. *ericoides* is native to North America, where its range extends from eastern Canada to northern Mexico, and it is introduced in parts of Europe (POWO 2024). The map in Figure 2 depicts the extent of *S. ericoides* var. *ericoides* in the United States and Canada.

The USDA PLANTS Database (2024b) shows records of *Symphyotrichum ericoides* var. *ericoides* in thirteen New Jersey counties: Atlantic, Bergen, Camden, Cape May, Gloucester, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Ocean, Sussex, and Warren (Figure 3). Specimens labeled as *S. ericoides* have also been collected in Burlington, Cumberland, Essex, Morris, Passaic, Salem, and Somerset counties (Mid-Atlantic Herbaria 2024). The data include historic observations and do not reflect the current distribution of the species.

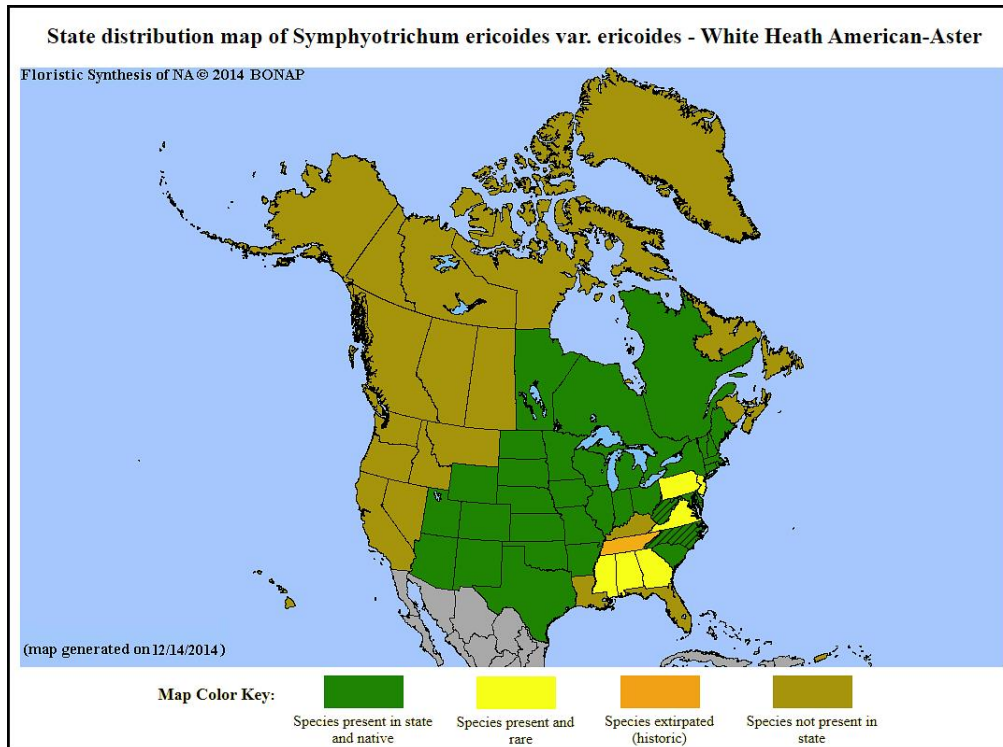


Figure 2. Distribution of *S. ericoides* var. *ericoides* in the United States and Canada, adapted from BONAP (Kartesz 2015). Cross hatching /// indicates a questionable presence.

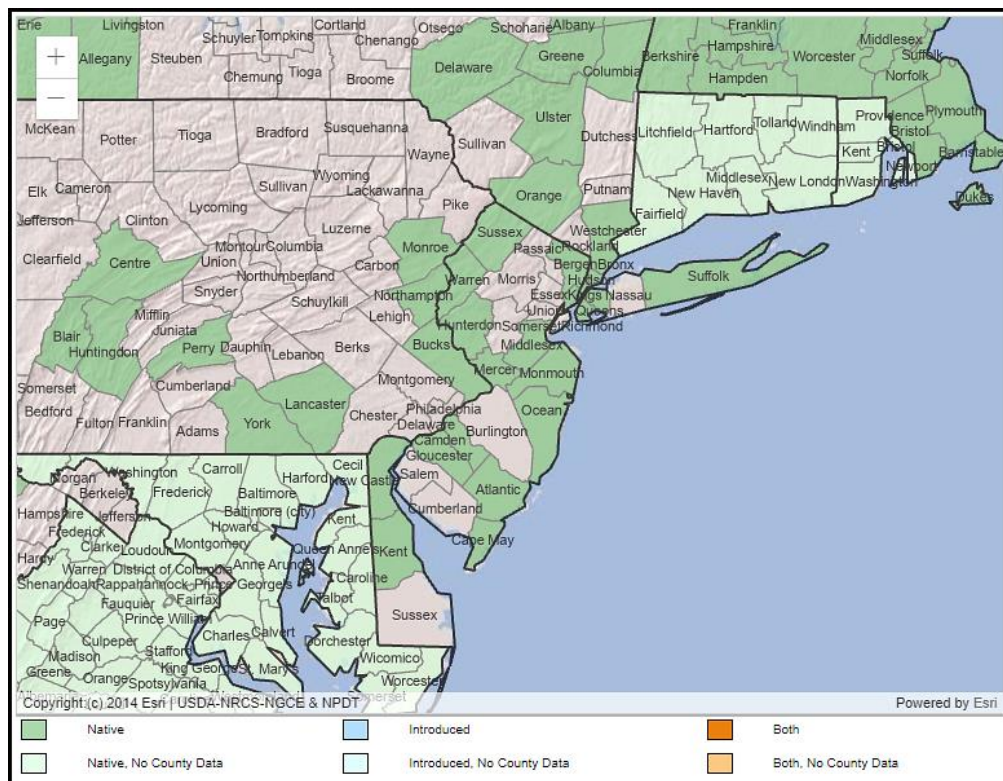


Figure 3. County records of *S. ericoides* var. *ericoides* in New Jersey and vicinity (USDA NRCS 2024b).

## Conservation Status

*Symphyotrichum ericoides* var. *ericoides* is considered globally secure. The G5T5 rank means the variety has a very low risk of extinction or collapse due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats (NatureServe 2024). The map below (Figure 4) illustrates the conservation status of *S. ericoides* var. *ericoides* in the United States and Canada. White Heath Aster is unranked in most of the places where it occurs, and it is viewed as an exotic species in Quebec. However, the variety is critically imperiled (very high risk of extinction) in two states, imperiled (high risk of extinction) in one state, and vulnerable (moderate risk of extinction) in one state and one province.

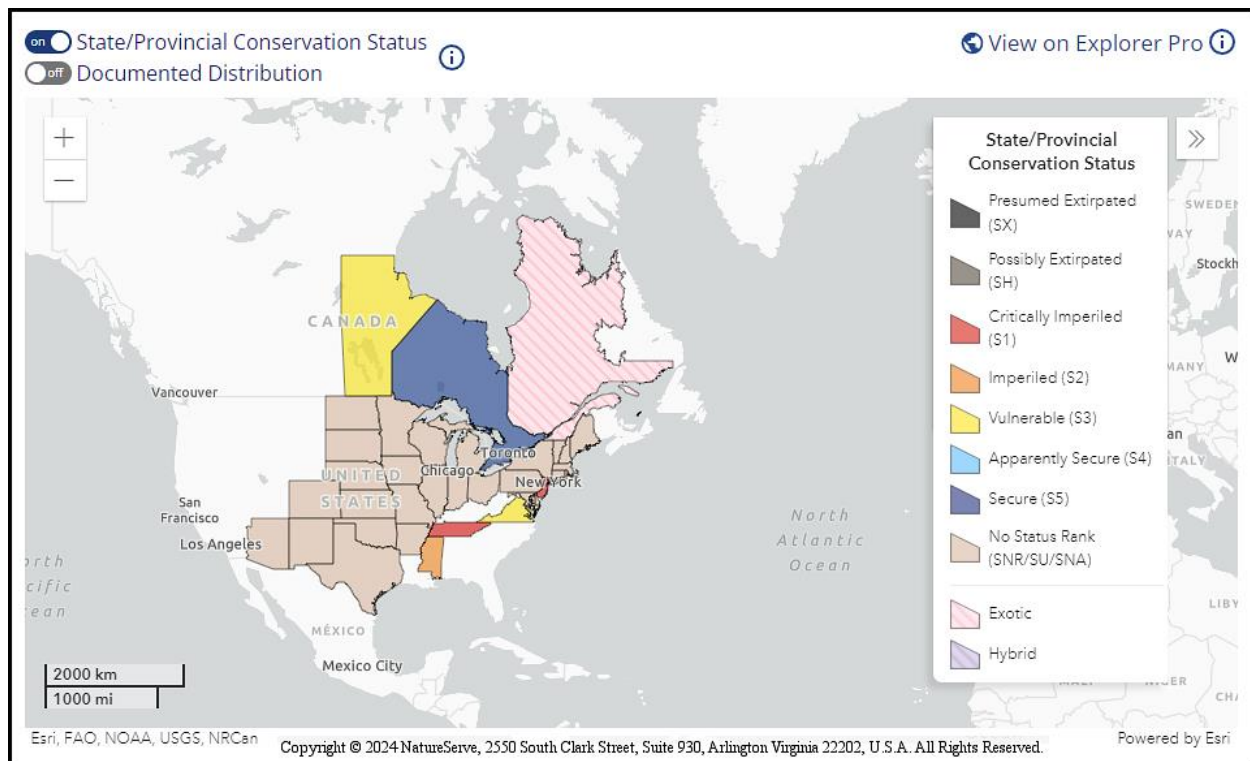


Figure 4. Conservation status of *S. ericoides* var. *ericoides* in the United States and Canada (NatureServe 2024).

New Jersey is one of the states where *Symphyotrichum ericoides* var. *ericoides* is critically imperiled (NJNHP 2024). The S1 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. *S. ericoides* var. *ericoides* has also been assigned a regional status code of HL, signifying that the species is eligible for protection under the jurisdiction of the Highlands Preservation Area (NJNHP 2010).

As noted in the previous section, *Symphyotrichum ericoides* was once widely reported around New Jersey. The species was generally characterized as common throughout the state outside of the Pine Barrens (Britton 1889; Stone 1911; Taylor 1915). Hough (1983) noted that some of the older records might be unreliable due to disagreement between botanists regarding the defining characteristics, and because *S. ericoides* had often been mixed up with species now known as



*Symphyotrichum pilosum* or *S. lateriflorum* var. *lateriflorum*. Some confusion likely resulted from a revision by Blake (1930) that transferred parts of what was known as *S. ericoides* to other species, and from differences of opinion over the acceptance of subtaxa (see Synonyms and Taxonomy section). Only three occurrences of *Symphyotrichum ericoides* var. *ericoides* are tracked by the state's Natural Heritage Program. Of those, one is considered of high viability, one is considered poor, and the other is verified extant (NJNHP 2024).

## **Threats**

Human activity is the primary threat noted at two New Jersey occurrences. At one coastal site, ongoing dune management and the installation of a paved public pathway directly through the plant population led to a significant decline in plant numbers, without subsequent recovery. Similarly, railroad ROW management may threaten the survival of another occurrence. The effect of vegetation management on that ROW White Heath Aster population will depend on which control methods are used (e.g., herbicide use or other activities incompatible with plant survival such as soil disturbance) and the frequency of management activity (NJNHP 2024).

White Heath Aster grows best in open, sunny areas and increased shading from successional changes may reduce plant numbers under those conditions. Although the encroachment of invasive non-native species has not been identified per se as a problem, successional changes are often coupled with the spread of those species.

Deer herbivory has not been recorded at any New Jersey occurrence of White Heath Aster. Wennerberg (2004) reported the species to be “resistant” to deer browse and not eaten by livestock; however, Linex (2020) noted that young plants are palatable to livestock in Texas populations, and White-Tailed Deer (*Odocoileus virginianus*) will browse on young plants to such an extent that high deer numbers may negatively affect plant survival and reproduction (Hilty 2020; LBJWC 2023). In a Nebraska study looking at the effects of cattle grazing intensity on the forage plant community, *S. ericoides* var. *ericoides* appeared to respond favorably to an absence of grazers on loamy sites while responding favorably to heavy grazing on wetter loamy overflow sites (Patton and Nyren 2014). It may be that some level of grazing can be beneficial in certain habitat types. Regarding other herbivores, White Heath Aster is a host plant for some Lepidopteran larvae (e.g., Pearl Crescent [*Phyciodes tharos*]), and animals such as Eastern Cottontails (*Sylvilagus floridanus*) and Wild Turkeys (*Meleagris gallopavo*) feed on leaves and/or seeds of the plant (Hilty 2020).

While this aster species can reproduce clonally via rhizomes, enabling plants to “move” to more suitable conditions for flowering if adjacent, the isolation of some populations will result in reduced distribution of this species as well as reduced genetic variability. There was no mention of disease in the literature as significantly affecting this species.

## Climate Change Vulnerability

Information from the references cited in this profile was used to evaluate the vulnerability of New Jersey's *Symphyotrichum ericoides* var. *ericoides* populations 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 *S. ericoides* var. *ericoides* was assessed as Less Vulnerable, meaning that climate change is not expected to have a notable detrimental impact on its extent in New Jersey by 2050. However, the conclusion was reached with only moderate confidence due to gaps in information regarding the species' ecological requirements.

Climate change in New Jersey is projected to lead to warmer temperatures and altered precipitation patterns with summer droughts becoming more common (Hill et al. 2020). These changes may negatively affect reproduction in *S. ericoides* var. *ericoides* as the seeds may require stratification to break dormancy. Germination rates under natural conditions are already low (Jones 1978), and any changes that might further reduce germination rates could affect population viability in New Jersey. Additionally, while considered somewhat drought tolerant once established (North Carolina Extension 2024), there may be a limit to that tolerance as the extent and/or timing of droughty periods shifts.

The effects of climate change on plant species growth, survival, and reproduction are complex. A study by Castillioni et al. (2022) of *S. ericoides* and other prairie plants in Oklahoma looked at plant growth response along an experimental precipitation gradient, finding that many of those species (including *S. ericoides*) responded favorably to projected increased precipitation and soil moisture levels. Similarly, *S. ericoides* responded negatively to increased amounts of bare ground, which would reduce soil moisture by exposure to solar heating and evaporation. With the addition of a disturbance (in this case vegetation clipping to mimic haying) along the same precipitation gradient, *S. ericoides* grew best in plots that were more species rich. Having a diversity of plant neighbors may have helped ameliorate the negative effects of vegetation cutting and soil exposure to drying in those situations. Although this study only looked at vegetation clipping as the disturbance, overgrazing or browsing may also alter a plant's response to abiotic factors that shift with climate change. This serves as a reminder of the difficulties of predicting plant community responses to climate change, especially when coupled with other more local disturbances.

Changes in future climatic conditions may also increase the threat of new invasive plant species encroachment into the state (Coville et al. 2021; Salva and Bradley 2023) as plant ranges shift in response to altered abiotic conditions. Additionally, sea level is projected to rise as much as 1.4 feet in New Jersey by 2050 (Hill et al. 2020) and coupled with greater storm intensity that could be problematic for the coastal dune occurrence of *S. ericoides* var. *ericoides*.

## **Management Summary and Recommendations**

It has been a number of years since the New Jersey White Heath Aster occurrences have been monitored; therefore, it would be important to revisit to all three sites to ascertain their current condition and extent of threats. For the occurrences most vulnerable to human activities, limiting or diverting access away from sensitive areas should be considered if possible. Excessive site visitation may lead to trampling of the plants and soil compaction, reducing seed germination and increasing the likelihood of invasive species introduction and spread.

Although no non-native species had been reported as of the date of the last occurrence observations, if any invasive species are found to be encroaching into *S. ericoides* var. *ericoides* habitat once new site monitoring is completed, implementation of control measures may be warranted. For the occurrence located along the railroad ROW, close collaboration with ROW managers could help ensure vegetation management activities do not harm the extant population. Similarly, while deer herbivory had not specifically been noted at any of the three New Jersey occurrences, White Heath Aster may be vulnerable to grazing especially when plants are young, warranting close monitoring of those occurrences.

White Heath Aster requires open, sunny locations in early successional habitat. In the Midwest, the species is often found in prairie communities where prescribed fire is used as a management tool to reduce shrub encroachment and maintain the natural habitat. In those situations, this species has responded favorably to fire, resprouting from underground rhizomes in the spring after fall burns (Wennerberg 2004). Depending on site conditions, prescribed fire may be a useful management tool to control succession for selected New Jersey occurrences. Mowing is another option for preventing shrub encroachment and shading of White Heath Aster populations; the closely related *Symphyotrichum praealtum* var. *angustior* has been managed by mowing on a three-year rotation to maintain suitable habitat (MANHESP 2015).

More research would be helpful regarding seed dispersal, viability, seed scarification, germination rates, and optimal conditions for vegetative spread under natural conditions. This would provide a better understanding about persistence and spread of White Heath Aster populations and help determine the potential effects of projected climatic changes on those important reproductive processes. If vegetation management is deemed necessary to keep habitats open, research into optimal actions, the timing of mowing or prescribed fire, and the frequency of either method would be useful. Maintaining habitat connectivity may be the most important action to allow for species migration with climate change.

## **Synonyms and Taxonomy**

The accepted botanical name of the species is *Symphyotrichum ericoides* (L.) G. L. Nesom var. *ericoides*. Orthographic variants, synonyms, and common names are listed below (ITIS 2024; Native Plant Trust 2024; POWO 2024; USDA NRCS 2024b; Weakley et al. 2024). New Jersey recognizes *Symphyotrichum ericoides* var. *prostratum* (Kuntze) G. L. Nesom as distinct from *S. ericoides* var. *ericoides* (NJNHP 2024). Blake (1930) distinguished the two varieties by the angle of their pubescence, although Fernald (1949) followed an earlier description by Kuntze

(1891)—noting that typical plants were upright and var. *prostratum* was "a depressed and windswept form." Most current sources view var. *prostratum* as a synonym of var. *ericoides* (eg., Brouillet et al. 2020; ITIS 2024; Kartesz 2015; NatureServe 2024; USDA NRCS 2024b; Weakley et al. 2024). One other variety that is widely accepted at the present time is *S. ericoides* var. *pansum*, but that has a more western distribution and does not occur in New Jersey (Brouillet et al. 2020; Kartesz 2015).

### Botanical Synonyms

*Aster ericoides* var. *ericoides*  
*Aster exiguus* (Fernald) Rydb.  
*Aster multiflorus* Aiton  
*Aster multiflorus* var. *exiguus* Fernald  
*Aster multiflorus* var. *prostratus* Kuntze  
*Aster polycephalus* Rydb.  
*Lasallea ericoides* (L.) Semple & L. Brouillet  
*Virgulus ericoides* (L.) Reveal & Keener

### Common Names

White Heath Aster  
White Heath American-aster  
Heath Aster  
White Prairie Aster  
White Aster  
Heath American Aster  
Squarrose White Aster

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Flower visiting insects of Heath Aster  
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