

Triantha racemosa

False Asphodel

Tofieldiaceae



Triantha racemosa by Yianni Laskaris, 2021

***Triantha racemosa* 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

501 E. State St.
PO Box 420
Trenton, NJ 08625-0420

Prepared by:
Jill S. Dodds
jsdodds@biostarassociates.com

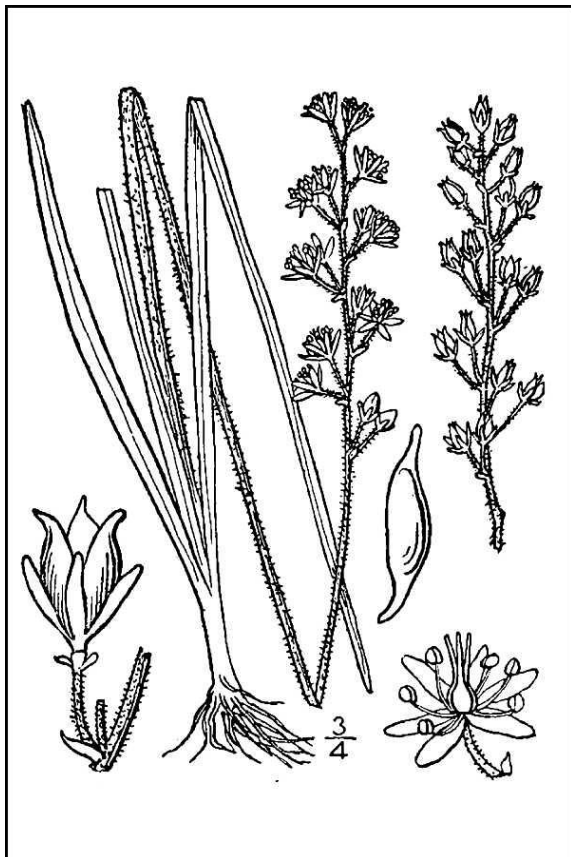
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New Jersey Department of Environmental Protection
Office of Natural Lands Management
New Jersey Natural Heritage Program
natlands@dep.nj.gov

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Life History

Triantha racemosa (False Asphodel) is a rhizomatous perennial herb that was formerly grouped with the bunchflowers or lilies but is currently placed in the Tofieldiaceae (see Synonyms and Taxonomy section). The leaves are entire, flat, and linear; extending for up to 4⁺ dm in length but only 6 mm in width. They are mostly basal although a few alternate leaves are often present on the lower part of the floral stems. The scape of the inflorescence, which is hairy and slightly glandular, can vary from 2–9 dm in height but it usually surpasses the leaves. The inflorescence itself is a narrow panicle bearing 15–80 flowers that are mostly arranged in clusters of three. Each flower has six white or slightly yellowish tepals and six stamens. The superior ovary contains numerous ovules and it is capped with three short styles that are fused at the base. The fruiting capsules of *T. racemosa* are 3–5 mm long, ovoid, and firm; and they are mostly enclosed by the surrounding tepals which are rigid at maturity. The reddish-brown seeds are about 1 mm long with a short, tail-like appendage at either end. (See Small 1903, Britton and Brown 1913, Fernald 1950, Gleason and Cronquist 1991, Packer 2020).



Left: *T. racemosa* by Britton and Brown 1913, courtesy USDA NRCS 2025a. Right: *Triantha* inflorescence from New Jersey by Yianni Laskaris, 2021.

Although New Jersey's *Triantha* populations have long been identified as *T. racemosa* the plants have characteristics that are not typical of the species. Some of their features more closely align with those of *T. glutinosa*, which has not been documented in the state. Packer (2020) suggested that the New Jersey populations might have originated from past hybridization between the two

species. *Triantha glutinosa* generally differs from *T. racemosa* in having well-developed glands on the stem hairs, capsules that are larger and papery in texture, and seeds with at least one tail that is longer than the body and somewhat contorted (Baker 1879, Gates 1918, Zomlefer 1997). *Triantha* plants in New Jersey tend to be more glandular and have more papery fruits than typical *T. racemosa* (Packer 2020). Godt et al. (1997) examined genetic diversity in *T. racemosa* but they only examined populations in Florida and the Carolinas. The results of more recent research that focused on the genetics and affiliations of New Jersey's *Triantha* populations are expected to become available in the near future (S. Eisenman, pers. comm.).

The observation that the glandular hairs on New Jersey's *Triantha* plants are more similar to those of *T. glutinosa* than those of *T. racemosa* might be consequential for a different reason. It was recently discovered that another member of the genus, *T. occidentalis*, obtains a significant amount of nitrogen from small insects that become trapped in its sticky stem hairs. The glands on the hairs secrete an enzyme that digests captured insects and nitrogen released by the process is transferred into the plants (Lin 2020, Lin et al. 2021). Most known carnivorous plants use modified leaves to trap their prey and it has been suggested that the flypaper-style capture used by *Triantha* gave rise to all of the other approaches (Freund et al. 2022). A comparison of insect capture success in *Drosera* and *Triantha* showed that the 'newer' strategies are more effective (Gordon et al. 2024). Nevertheless, Lin et al. (2021) demonstrated that the *Triantha occidentalis* technique has the potential to offset low rates of nutrient availability in certain habitats, warranting a closer look at other members of the genus. Lersten and Curtis (1977) reported that *T. occidentalis* and *T. glutinosa* had secretory hairs while those of *T. racemosa* were non-secretory, and both glycosides and flavonols were found in the secretions of *T. glutinosa* (Wells and Böhm 1994). It has not yet been determined whether *T. glutinosa* is carnivorous: Graenicher (1907) observed that ants were able to traverse the sticky stems with impunity but a photo taken by Veronique McIntyre (2022) attests to the fact that small insects like aphids sometimes get stuck in its glandular hairs.

In New Jersey, *Triantha* begins to bloom late in June and the flowering period continues into July, while fruits develop during late July and August (Stone 1911; Hough 1983; Gordon 2004, 2006, & 2015, NJNHP 2024). Notes from the latter source suggest that fruits may remain on standing scapes well into autumn. The timing is consistent with that reported for *Triantha racemosa* (Smith 1818, Weakley et al. 2024). Some surveys of New Jersey occurrences recorded the presence of both flowering and vegetative plants. Others seemed to suggest that all of the plants present were reproductive, although it is not clear whether non-flowering plants were overlooked at those sites. Instances where the numbers of both reproductive and vegetative plants were documented resulted in reproductive rates of 19.3 %, 37.5%, and 54.5% (NJNIHP 2024). At one New Jersey site in 2023 it was noted that the vast majority of *Triantha* plants lacked inflorescences (P. Stone, pers. comm.).

Pollinator Dynamics

Triantha flowers produce nectar and they are pollinated by insects (Zomlefer 1997, Hilty 2020). The flowers of *T. glutinosa* are visited by flies from at least five different families as well as small bees and wasps, butterflies, ants, and beetles (Graenicher 1907, Douglas 1983, Bess et al.

2023). A comparable array of visitors has been recorded on the similar blooms of *Tofieldia* species in Europe (Knuth 1909). A photo by Link Davis (below) captured a bee and several flies on *Triantha* flowers in New Jersey.



Some insects visiting *Triantha* by Link Davis, 2013.

In reference to *Triantha glutinosa*, Graenicher (1907) remarked that "*The flowers are sufficiently visited by insects to insure either self or cross-pollination, and spontaneous self-pollination from the falling of pollen on the stigma is barely probable since the latter is usually not situated directly below an anther.*" Although no evidence of self-compatibility in *Triantha* was found it has been recorded in related genera including *Tofieldia* and *Harperocallis* (Knuth 1909, Pitts-Singer et al. 2002, Vlasta et al. 2025). The development of embryos following fertilization has been described in detail for *Triantha glutinosa* (Holloway and Friedman 2008).

Seed Dispersal and Establishment

Triantha seeds are small and light, and wind is their primary means of dispersal (Rendle 1930, Zomlefer 1997). In the riverside habitats utilized by False Asphodel in New Jersey it is likely that some water-aided dispersal also occurs. Distribution over longer distances might occasionally result from adherence of the small seeds to wet feet, feathers, or fur but that is probably rare, as New Jersey's unique *Triantha* has not spread beyond the core Pine Barrens region of the state.

No information was found regarding seed longevity, germination, or seedling development in *Triantha*. The germination of *Tofieldia calyculata* seeds is enhanced by light and reduced by freezing (Maas 1989). Mycorrhizae have been documented in *Tofieldia pusilla* (Wang and Qiu 2006), although it is not clear if fungal associations are required for seedling establishment.

Habitat

In New Jersey, False Asphodel can be found in Pine Barren riverside savannas or other open, herb-dominated boggy areas associated with Atlantic White Cedar (*Chamaecyparis thyoides*) swamps and Pitch Pine (*Pinus rigida*) lowlands (Fairbrothers and Hough 1973, Snyder and Vivian 1981, Hough 1983, Gordon 2006, Bien et al. 2009, Johnson and Walz 2013, NJNHP 2024). The habitats are situated in floodplains where the water table is at the surface: They are typically seepage-fed and subject to occasional inundation. The pH is generally acidic and a well-developed peat layer is present (Breden et al. 2001, Walz et al. 2006). *Triantha racemosa* has a heliophily rank of 9, signifying that it requires an open canopy (Weakley et al. 2024). The majority of New Jersey's *Triantha* occurrences are situated in sunny, open sites, although a few have been found growing in filtered light beneath *C. thyoides* (NJNHP 2024).

Stone (1911) observed that the state's *Triantha* populations were limited to habitats utilized by *Narthecium americanum*—a globally imperiled species that is no longer extant outside of New Jersey (NatureServe 2025)—and that *Triantha* was even less frequently encountered. At least 30 other state-listed species have been documented in Pine Barren savannas (Walz et al. 2006). Some other plants commonly encountered in the communities include *Andropogon glomeratus*, *Carex exilis*, *Cladium mariscoides*, *Drosera* spp., *Eriocaulon* spp., *Lophiola aurea*, *Muhlenbergia* spp., *Pogonia ophioglossoides*, *Rhynchospora* spp., *Sarracenia purpurea*, *Sphagnum* spp., and *Vaccinium macrocarpon* (Breden et al. 2001, Walz et al. 2006, NJNHP 2024). Bien et al. (2009) identified *Agalinis fasciculata*, *Rhynchospora pallida*, and *Scleria reticularis* as significant associates in one location.

In addition to narrow hydrological conditions, periodic fires can play a role in creating and perpetuating New Jersey's savanna communities (Walz et al. 2006). *Triantha racemosa* has been documented in fire-maintained habitats in the southeastern United States (Frost 1995, McMillan et al. 2002). The rate of flowering in *T. racemosa* populations usually increases after a burn (Hinman and Brower 2007, Brewer and Zee 2021). However, Hinman and Brower found no evidence that the higher flowering rates were linked to an increase in seedling recruitment.

Wetland Indicator Status

Triantha racemosa is an obligate wetland species, meaning that it almost always occurs in wetlands (U. S. Army Corps of Engineers 2022).

USDA Plants Code (USDA, NRCS 2025b)

TRRA6

Coefficient of Conservancy (Walz et al. 2020)

CoC = 10. 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

The global range of *Triantha racemosa* is restricted to the southeastern and mid-Atlantic United States (POWO 2025). The map in Figure 1 depicts the extent of *T. racemosa* in North America.

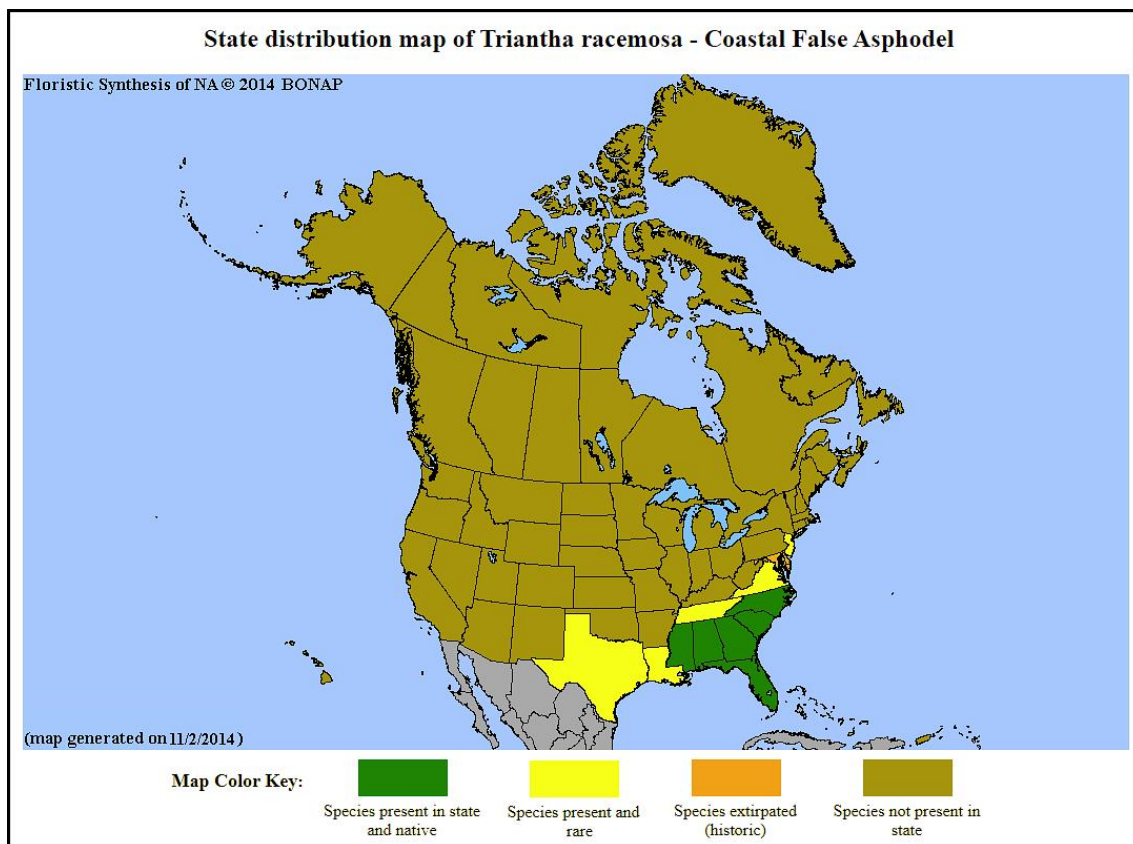


Figure 1. Distribution of *T. racemosa* in North America, adapted from BONAP (Kartesz 2015).

The USDA PLANTS Database (2025b) shows records of *Triantha racemosa* in two New Jersey counties: Burlington and Ocean (Figure 2). A single specimen reportedly originated from Atlantic County (Mid-Atlantic Herbaria 2025). The data include historic observations and do not reflect the current distribution of the species.

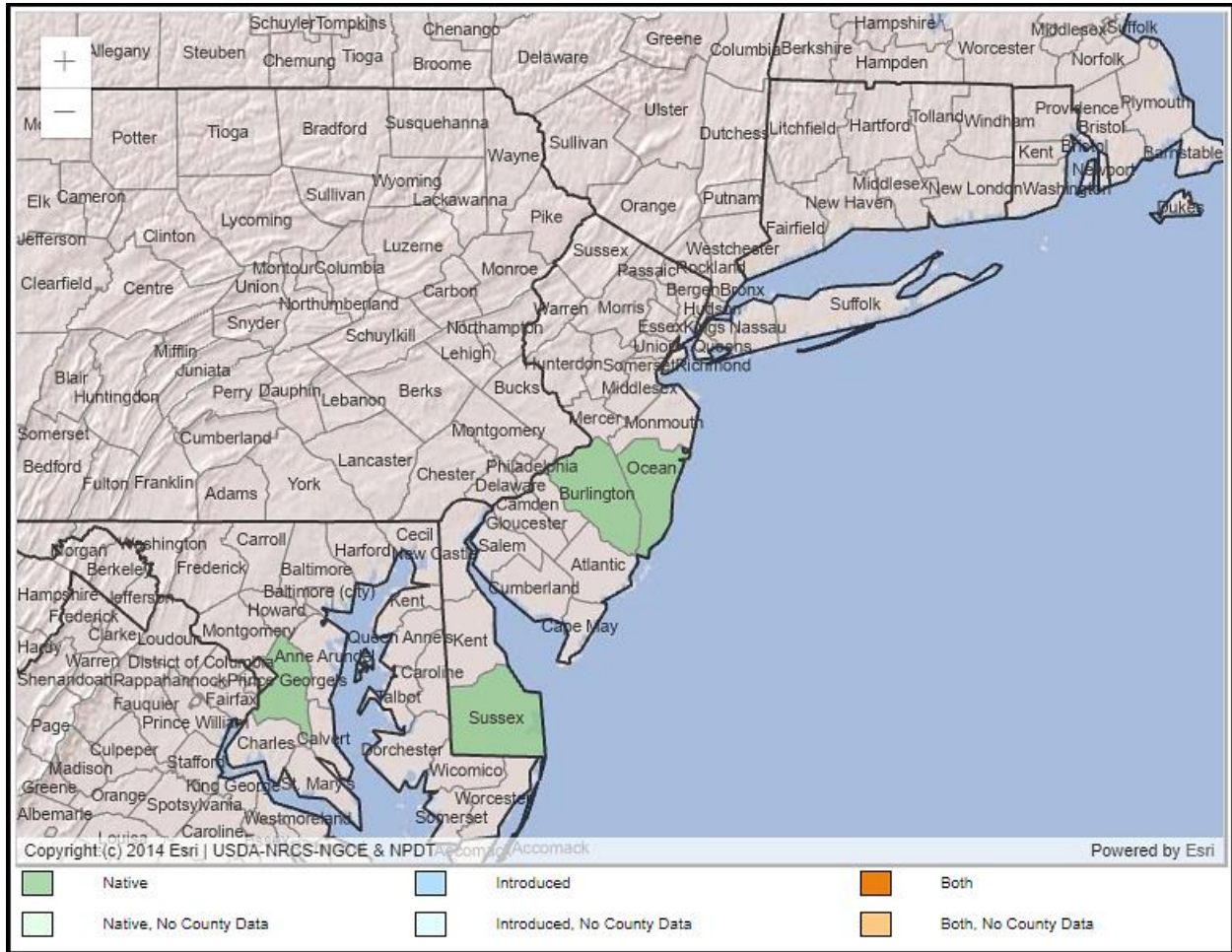


Figure 2. County records of *T. racemosa* in New Jersey and vicinity (USDA NRCS 2025b).

Conservation Status

Triantha racemosa is considered globally secure. The G5 rank means the species 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 2025). The map below (Figure 3) illustrates the conservation status of *T. racemosa* throughout its range. The species is apparently secure or unranked in most of the southeast, with the exception of Louisiana where it is imperiled (high risk of extinction). False Asphodel is much rarer at the northern end of its range: The species is critically imperiled (very high risk of extinction) in two states, possibly extirpated in Virginia, and presumed extirpated in Delaware and Maryland.

Triantha racemosa 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 species has a rank of R1 (critically imperiled), signifying a high risk of regional extinction (Frances 2017).

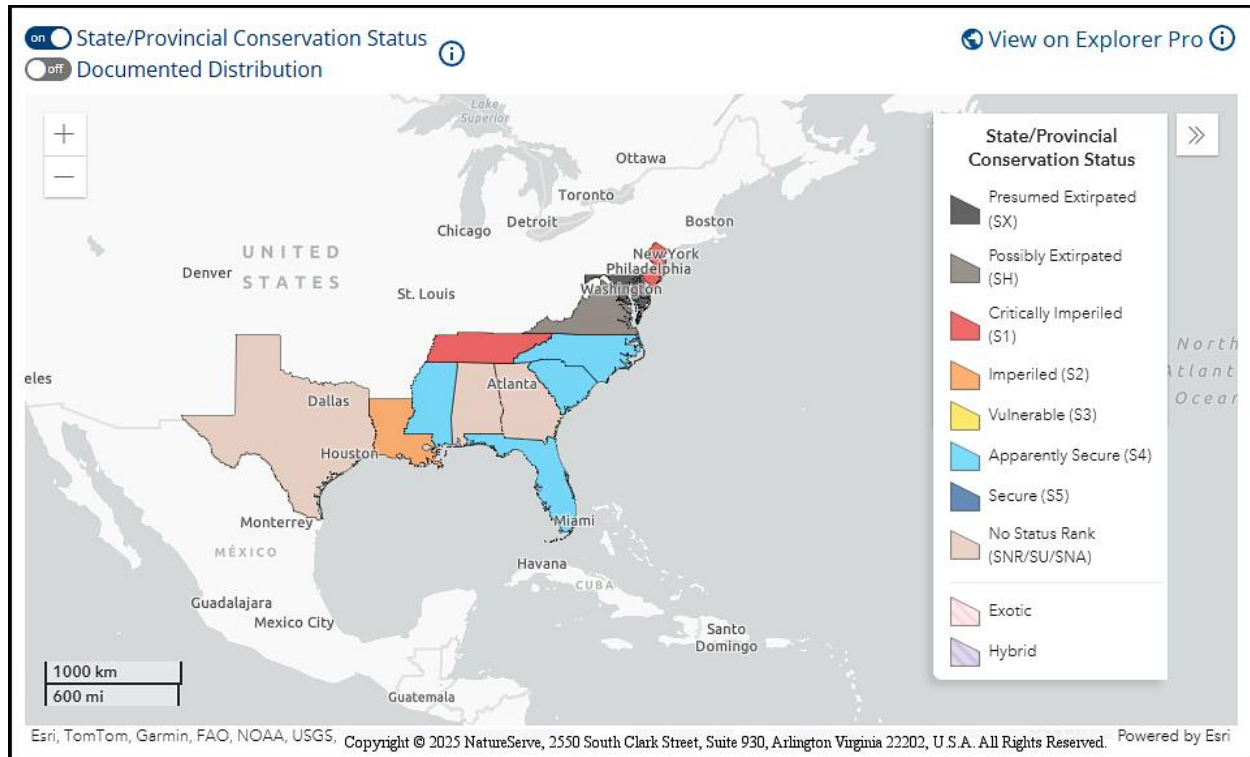


Figure 3. Conservation status of *T. racemosa* in North America (NatureServe 2025).

New Jersey is one of the two states where *Triantha racemosa* is listed as critically imperiled (NJNHP 2024). The S1 rank often 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. *T. racemosa* is also listed as an endangered species (E) in New Jersey, meaning that without intervention it has a high likelihood of extinction in the state. Although the presence of endangered flora may restrict development in certain communities such as wetlands or coastal habitats, being listed does not currently provide broad statewide protection for the plants. Additional regional status codes assigned to False Asphodel signify that the species is eligible for protection under the jurisdictions of the Highlands Preservation Area (HL) and the New Jersey Pinelands (LP) (NJNHP 2010).

Triantha racemosa has been documented in New Jersey since the mid-1800s but it has always been rare in the state (Baker 1879, Britton 1889, Stone 1911, Taylor 1915). False Asphodel is restricted to the state's Pine Barrens region, and outside of 1850s-era collections from one site in Ocean County and a single collection by Edwin B. Bartram in Atlantic County at the beginning of the 20th century the documented occurrences have been confined to Burlington County (Knieskern 1857, Fables 1957, Fairbrothers and Hough 1973, Breden et al. 2006, Mid-Atlantic Herbaria 2025). *T. racemosa* was initially classified as a state endangered species by the New

Jersey Pinelands Commission (1980) and by Snyder and Vivian (1981). It was officially recognized as one of New Jersey's extremely rare plants in 1984 and has been ranked S1 and listed as endangered ever since (NJONLM 1984, 1990, 1992). Twenty occurrences are presently tracked as extant by the Natural Heritage Program, although not all of the records are recent (NJNHP 2024). The plant's critically imperiled status reflects its narrow habitat requirements and limited range within the state.

Threats

Many of New Jersey's *Triantha* populations are on protected land and no direct threats have been identified, although beavers are active in the vicinity of some occurrences so the local hydrology could be altered (NJNHP 2024). The greatest danger for False Asphodel populations in New Jersey is habitat loss or degradation, as Pine Barren Savanna communities are rare in and of themselves. General threats to savanna habitat include changes in the community composition resulting from natural succession, water table drawdown, and the introduction of sediments or nutrients from offsite agricultural activities. Direct damage to flora from off-road vehicles or foot traffic has also been noted at some locations (Greene et al. 2006, Johnson and Walz 2013).

The potential effect of White-tailed Deer overabundance on *Triantha* populations in New Jersey does not appear to have been examined. The floral stems of plants with similar growth forms are often nipped off while they are still in bud (pers. obs.), reducing their reproductive capacity. However, during a comparative study of northern peatlands, the presence or absence of deer did not appear to make a significant difference in the abundance of *T. glutinosa* plants (Pellerin et al. 2006).

Climate Change Vulnerability

An assessment of potential climate change impacts on selected New Jersey plants by Ring et al. (2013) ranked *Triantha racemosa* as Presumed Stable because the authors found little evidence that its abundance or range would substantially change by 2050. In New Jersey, the impacts of climate change include both elevated temperatures and longer, more frequent summer droughts (Hill et al. 2020). Although Pine Barren savanna communities are expected to remain relatively stable as the climate continues to warm they can be susceptible to changes in hydrologic conditions (Johnson and Walz 2013). *Triantha racemosa* is essentially a southern species that reaches the northern end of its range in New Jersey so higher temperatures might prove to be beneficial in this region. If the *Triantha* plants in the state are confirmed as a unique taxon their vulnerability to climate change will need to be reconsidered.

Management Summary and Recommendations

No management needs have been identified for the *Triantha* populations in New Jersey but an updated assessment of the plant's statewide status is needed. Only 25% of the extant occurrences have been monitored within the past decade and 50% were last observed during the 1980s or

1990s. There are also a number of historical collection sites that have not been searched (NJNHP 2024). In addition to obtaining more up-to-date information about the extent and condition of populations, site visits provide an opportunity to evaluate habitat conditions and make note of emerging threats. While monitoring False Asphodel, an effort should be made to count vegetative plants as well as those in flower or fruit and to record any evidence of herbivory.

Conservation planning for *Triantha racemosa* would benefit from an investment in research. Information about self-compatibility, seed longevity, germination requirements, seedling development, and mycorrhizal associations is lacking for the genus as a whole. More detailed studies are also needed to evaluate the effects of fire on False Asphodel. It will be interesting to learn whether *Triantha glutinosa* is partially carnivorous, and whether the larger glands on New Jersey *Triantha* plants also permit them to capture small insects.

Synonyms and Taxonomy

The accepted botanical name of the species is *Triantha racemosa* (Walter) Small. Some orthographic variants, synonyms, and common names are listed below (ITIS 2025, POWO 2025, USDA NRCS 2025b).

Botanical Synonyms

Tofieldia racemosa (Walter) Britton, Sterns & Poggenb.
Abama pubens (Michx.) Raf.
Asphodeliris racemosa (Walter) Kuntze
Melanthium racemosum Walter
Nartheceium pubens Michx.
Tofieldia pubens (Michx.) Willd.
Tofieldia pubescens Pers.
Triantha pubens (Michx.) Baker
Trianthella racemosa (Walter) House

Common Names

False Asphodel
Coastal False Asphodel
Viscid False Asphodel

It is worth briefly reviewing the colorful taxonomic history of *Triantha racemosa*. False Asphodel was first identified as *Melanthium racemosum* by Thomas Walter in 1788 and some later authors included it in the genus *Nartheceium* before it landed in *Tofieldia*. During his early attempt to clear up confusion around the genus Smith (1818) identified it as *Tofieldia pubens*. Nuttall (1818) first established *Triantha* as a genus, noting that it was unquestionably distinct from *Tofieldia*. *Triantha* was recognized during the late 1800s and early 1900s (e.g. Baker 1879, Small 1903, Britton and Brown 1913, Gates 1918) but later in the 1900s it was included in *Tofieldia* (e.g. Fernald 1950, Gleason and Cronquist 1991, Zomlefer 1997). An exception was Packer (1993) who argued in favor of re-establishing *Triantha*. Morphological, chemical, and genetic evidence from studies conducted during the present century has provided strong support for the separation of *Triantha* and *Tofieldia* (Tamura et al. 2010, Azuma and Tobe 2011, Remizowa et al. 2012, Iwashina et al. 2013).

The higher-level classifications of *Triantha/Tofieldia* have also shifted considerably. The genera had been included in various families such as Colchiaceae, Liliaceae, and Melanthyaceae before Armen Takhtajan established the Tofieldiaceae in 1995, and in turn those families had been assigned to an assortment of orders including Liliales, Melanthiales, and Nartheciales (Baker 1879, Zomlefer 1997 & 1999, Luo et al. 2016). After Tofieldiaceae was described the family was briefly placed in the order Tofieldiales by Reveal and Zomlefer (1998) but the Angiosperm Phylogeny Group transferred it to the Alismatales shortly thereafter (APG 1998). Recent work indicates that Tofieldiaceae is the oldest lineage in the Alismatales (Luo et al. 2016, Timilsena et al. 2022).

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