# *Dichanthelium tenue*

**White-edge Panic Grass**

**Poaceae**

*Dichanthelium tenue* by Keith Bradley, 2009

***Dichanthelium tenue* 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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May, 2025

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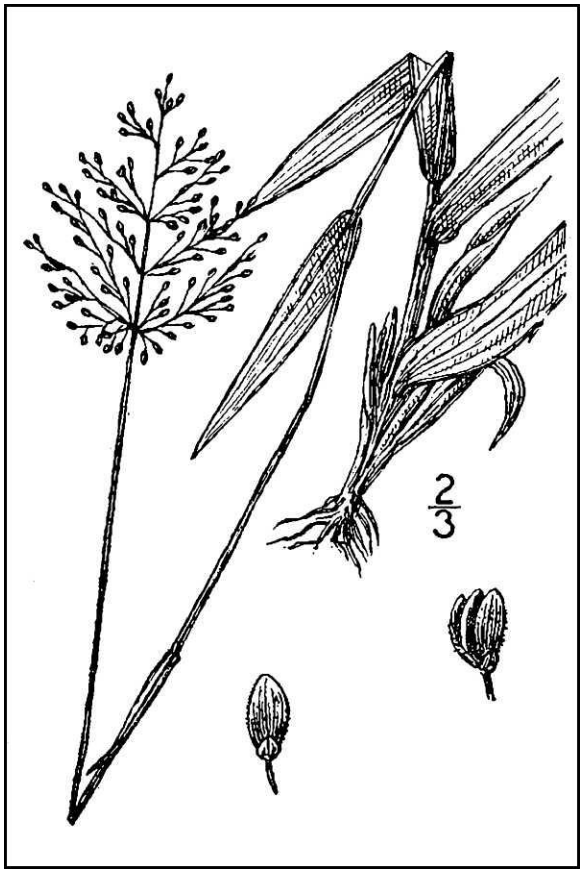
This report should be cited as follows: Dodds, Jill S. 2025. *Dichanthelium tenue* Rare Plant Profile. New Jersey Department of Environmental Protection, State Parks, Forests & Historic Sites, Forests & Natural Lands, Office of Natural Lands Management, New Jersey Natural Heritage Program, Trenton, NJ. 17 pp.

## Life History

*Dichanthelium tenue* (White-edge Panic Grass) is a perennial member of the grass family. Species in the genus *Dichanthelium* are sometimes referred to as rosette grasses because they form basal rosettes of winter leaves that are relatively short and wide. The seasonal growth habits of *Dichanthelium* species also set them apart from other grasses in the mid-Atlantic region because they typically have multiple flowering periods each year. In the spring (vernal phase) the plants produce simple culms with narrow leaves and many-flowered panicles. Later in the season (autumnal phase) the stems develop numerous short branches with reduced leaves and smaller lateral panicles that are often sheathed (Hitchcock and Chase 1910, Gould and Clark 1978). Many species also have an intermediate phase with unique characteristics (Majure et al. 2024, Weakley et al. 2024). Shinners (1944) observed that it is best to use vernal phase plants for identification of *Dichanthelium* species.




Left: Britton and Brown 1913, courtesy USDA NRCS 2025a. Right: Allison Wilson, 2023.

The rosette and stem leaves of *Dichanthelium tenue* have firm, white edges. The basal leaves are usually 1–5 cm long and ovate or lance-shaped. Plants with larger leaves (up to 10 cm) have sometimes been found. Dead leaves from the previous year often persist in the rosettes. The slender culms develop in small, tight clumps and are usually less than half a meter in height. Each stem has 3–4 leaves with short, veined sheaths and small (0.2–0.5 mm) ligules that resemble a band of hairs. The blades are ascending or spreading and roughly 10 times as long as wide, with the uppermost leaf notably shorter than those lower on the stem. The vernal panicles

of *D. tenue* are relatively few-flowered, pyramid-shaped, and 3–6 cm long; the autumnal panicles are similar but sparingly branched and about half the size. The spikelets are 1.3–1.7 mm long, hairy, and often purple-tinged. Aside from the spikelets, the remaining parts of *D. tenue* are generally smooth. (See Hitchcock and Chase 1910, Britton and Brown 1913, Fernald 1950, Hitchcock 1950, Gould and Clark 1978, Gleason and Cronquist 1991, Barkworth 2021).

Although $C_4$ photosynthesis is common in the grass family, all species of *Dichanthelium* use the $C_3$ photosynthetic pathway (Brown and Smith 1975). The initiation of culm development in the genus appears to vary with latitude (LeLong 1965). White-edge Panic Grass has been placed in *Dichanthelium* section *Ensifolia*. The nearest relative occurring in New Jersey is *D. ensifolium*, which does not have white-margined leaves, although some plants may display intermediate features. *Dichanthelium* is a notably complex genus and *D. tenue* shares characteristics with members of several other sections (e.g. sect. *Dichanthelium*, sect. *Sphaerocarpa*). A hybrid with *D. portoricense* (sect. *Lancearia*) has been reported (Barkworth 2021, Majure et al. 2024, Weakley et al. 2024).

## Pollinator Dynamics

Most species of *Dichanthelium* can produce both chasmogamous (open and outcrossing) and cleistogamous (closed and self-pollinating) flowers (Hitchcock and Chase 1910). The chasmogamous flowers usually develop earlier, occurring primarily in large inflorescences that are positioned at the ends of culms: They have large anthers that release copious amounts of pollen which is transported by wind. Flowers on secondary branches are more likely to have small anthers and be self-pollinated, although they may not be completely cleistogamous; however, most of the rosette-grasses can produce at least a few flowers that are strictly cleistogamous. Some *Dichanthelium* flowers are fertilized even before they emerge from the sheaths. Self-fertilization appears to be prevalent in the genus while cross-pollination is of secondary importance (LeLong 1965, Spellenberg 1975, Campbell et al. 1983).

*Dichanthelium* fruits that develop from chasmogamy and cleistogamy are comparable in size, but those in the latter group may germinate at lower percentages or take longer to develop (Campbell et al. 1983). Cleistogamous flowers of *Dichanthelium clandestinum* produced ten times as many seeds as the chasmogamous flowers (Bell and Quinn 1985), and even when that ratio was shifted by environmental conditions the plants allocated more resources to cleistogamous reproduction (Bell and Quinn 1987). Although seeds produced by both flower types were equally viable, those resulting from cleistogamy germinated faster while those from chasmogamous flowers had greater dormancy—suggesting that the latter type may play a key role in the long-term maintenance of populations (Bell and Quinn 1985).

## Seed Dispersal and Establishment

*Dichanthelium* seeds are rounded and smooth with no notable adaptations for distribution. Gravity has been cited as the primary means of dispersal for some species (Kirkman et al. 2004), and Bell and Quinn (1985) observed that the seeds of *D. clandestinum* were not dispersed over

great distances. In some of the rosette-grasses stem breakage can result in seed movement as fragments of the stalks are blown around the wind (Campbell et al. 1983). It is likely that animals play a role in both local and longer-distance dispersal. Grass seeds are an important food source for numerous birds (Fassett 1975) and *Dichanthelium* seeds are favored by wintering sparrows (DiMiceli et al. 2007, Korosy 2013) and an assortment of small mammals (Smith 2020). Larger herbivores that consume the grasses can also excrete viable seeds, and the germination of *Dichanthelium* seeds from deer pellets was reported by Pile et al. (2015) and Flaherty et al. (2017).

*Dichanthelium tenue* forms a seed bank (Cohen et al. 2004, Martin 2006, Stuble 2008). It is not clear how long the seeds can remain viable in the soil, and no information was found regarding the species' germination requirements. Some other members of the genus are facultatively mycorrhizal (Tawaraya 2003, Tahat and Sijam 2012) but fungal associates are probably not essential for establishment.

## Habitat

*Dichanthelium tenue* can occupy a broad range of habitat types (Drew et al. 1998, Barkworth 2021). The grass has been found in marshy areas, bogs, seeps, flatwoods or savannas, and stream drainages (Gould and Clark 1978, Allen et al. 2013, Delahoussaye et al. 2014, Thornhill et al. 2014, Kirby 2019, NJNHP 2024); in dry prairies and subxeric uplands (Orzell and Bridges 2006a, Carr et al. 2010); and in ecotones between upland and wetland sites (Kirkman et al. 1998a, Sorrie et al. 2006). *D. tenue* may become abundant in both wet and dry locations (Allen et al. 2004, Carr et al. 2010, Orzell and Bridges 2022). It has been recorded on a seasonally inundated lake shore (Luken and Bezold 2000) and in a variety of coastal communities (Anderson and Alexander 1985, Battaglia 2016, Faucette 2016). Reported substrates have been described as acidic or calcareous (Gould 1980, Orzell and Bridges 2006b) and the species has been known to grow on sand, peat, clay, or occasionally on rock outcrops (Alford 2001, Zomlefer et al. 2019, Weakley et al. 2024).

Szakacs et al. (2022) categorized *Dichanthelium tenue* as a generalist in terms of its light or shade preferences but the heliophily rank assigned by Weakley et al. (2024) suggests that the species will fare better in open sites. *D. tenue* is regularly found in pine-dominated forests, where it may even be one of the more frequent herbaceous plants (Easley and Judd 1990, Cohen et al. 2004, Palmquist et al. 2014, Thornhill et al. 2014, Kees 2022). Nevertheless, it appears to benefit from periodic disruption. Some of the communities utilized by the grass are naturally or intentionally maintained by fire (Kirkman et al. 1998b, Gilliam et al. 2006, Carr et al. 2010, Glitzenstein et al. 2012, McFarland et al. 2020). *D. tenue* has colonized sites that have experienced severe disturbances from agriculture, logging or the establishment of plantations (Kees 2022), and the species was noted to be more abundant at disturbed sites than it was in stable communities (Cohen et al. 2004).

## Wetland Indicator Status

No wetland indicator status is provided for *Dichanthelium tenue* but many sources treat it as a variety of *D. dichotomum*. *Dichanthelium dichotomum* is a facultative species, meaning that it occurs in both wetlands and nonwetlands (U. S. Army Corps of Engineers 2022).

## USDA Plants Code (USDA, NRCS 2025b)

The USDA identifies the species as *Dichanthelium dichotomum* var. *tenue* (code DIDIT) and does not list a separate code for *Dichanthelium tenue*.

## 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

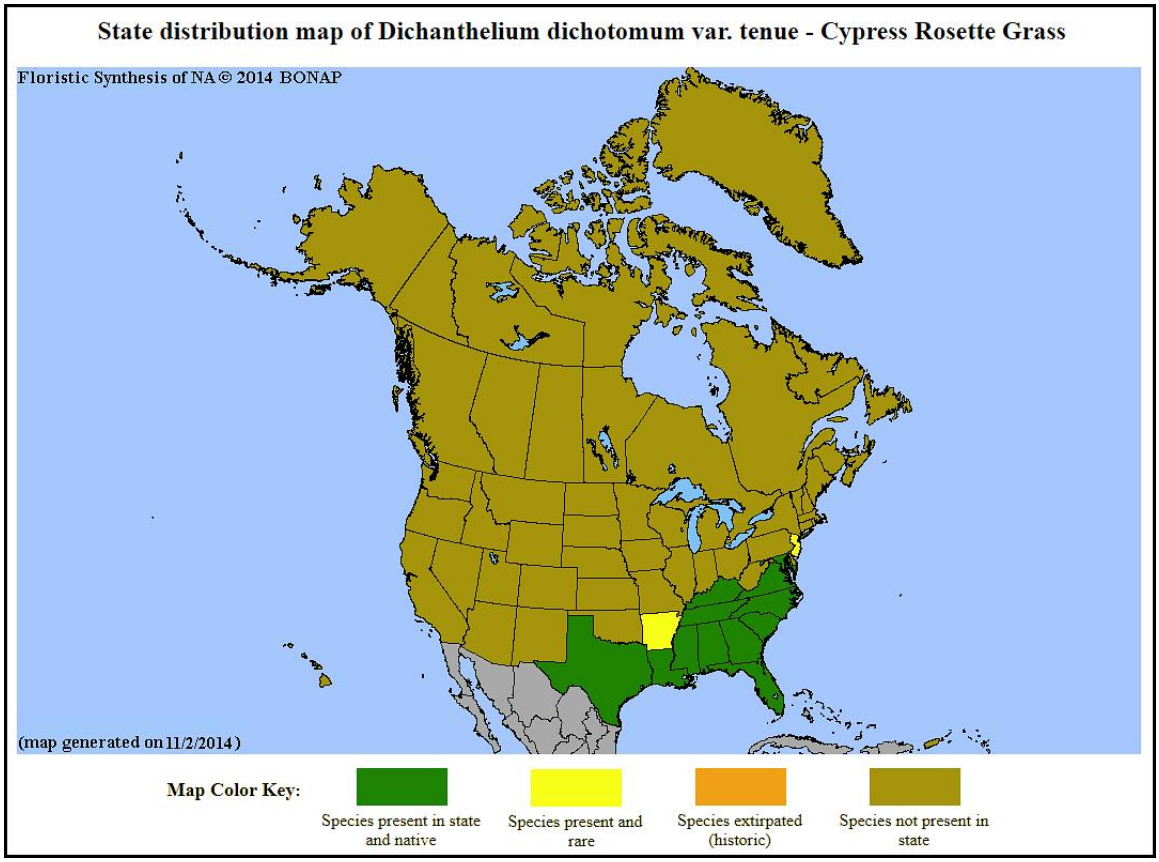



*Figure 1. Distribution of D. tenue in the United States and Canada, adapted from BONAP (Kartesz 2015).*

The global range of *Dichanthelium tenue* is restricted to the southeastern United States and parts of Mexico (Barkworth 2021, POWO 2025). The map in Figure 1 (above) depicts the extent of the species in the United States and Canada.

*Dichanthelium tenue* has been reported in three New Jersey counties: Burlington, Cape May, and Cumberland (Figure 2 below). The data include historic observations and do not reflect the current distribution of the species.

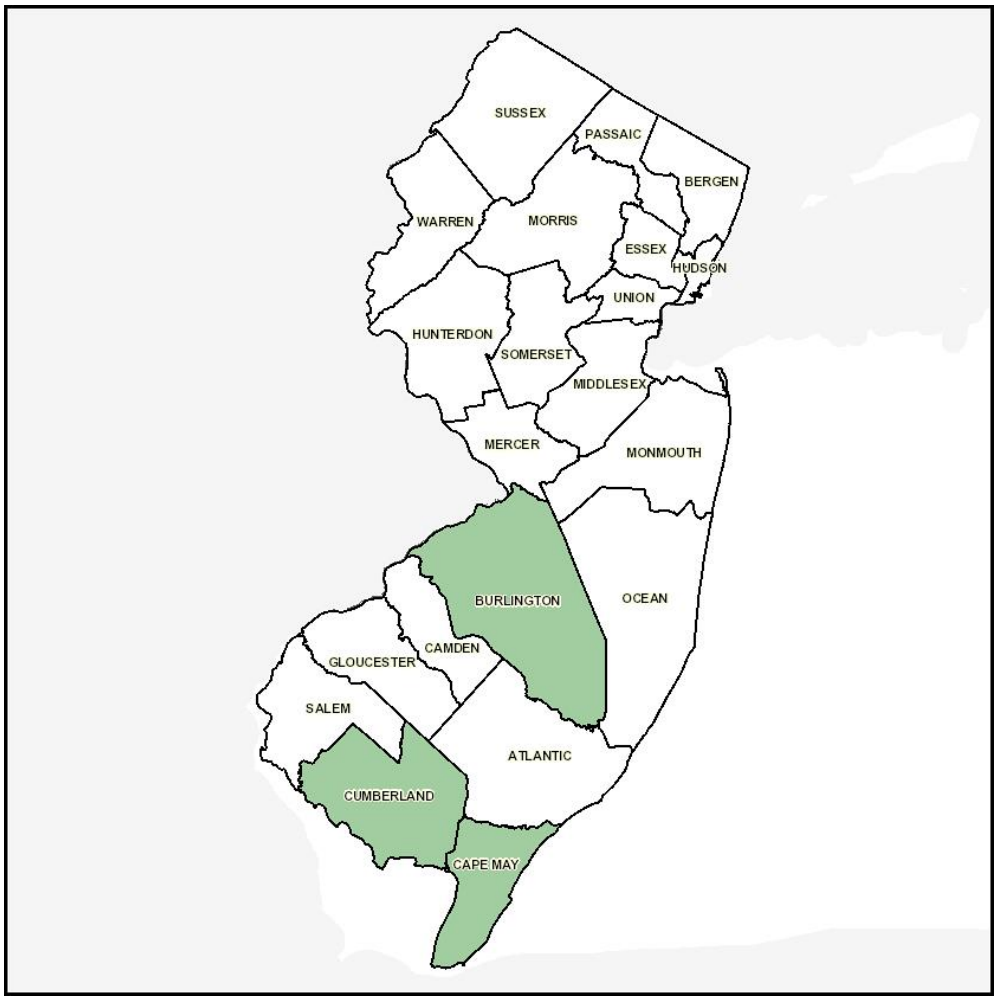



*Figure 2. County records of D. tenue in New Jersey (source data from Moore et al. 2016, NJNHP 2024, and Mid-Atlantic Herbaria 2025).*

## Conservation Status

The global rank of *Dichanthelium tenue* reflects some uncertainty as to whether it should be considered apparently secure or secure. NatureServe treats *D. tenue* as a variety of *D. dichotomum* with a rank of 4 or 5. A G4 species has a fairly low risk of extinction or collapse due to an extensive range and/or many populations or occurrences, although there is some cause for concern as a result of recent local declines, threats, or other factors. A G5 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 *Dichanthelium tenue* in the United States. The grass is unranked or apparently secure in most of the states where it occurs but it is rare in the northern part of its range. It is vulnerable (moderate risk of extinction) in two states, critically imperiled (very high risk of extinction) in two states, and possibly extirpated in Delaware.

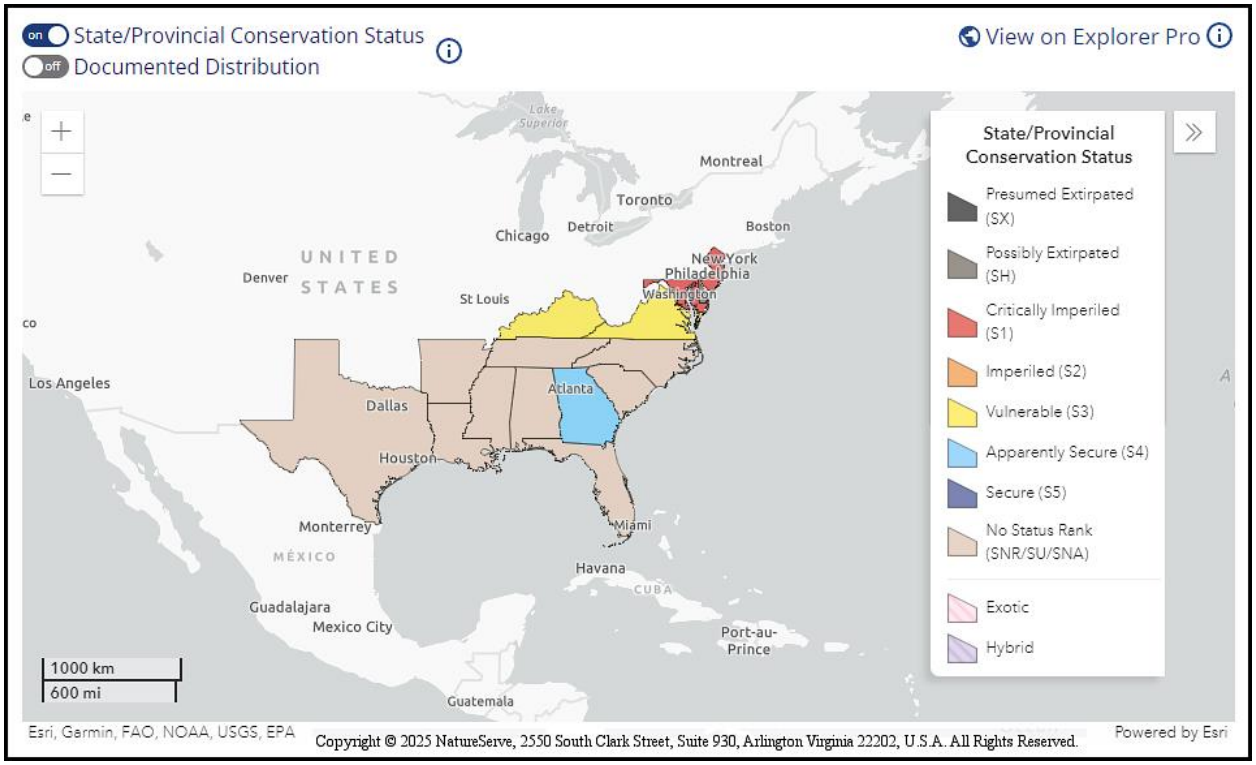



*Figure 3. Conservation status of D. tenue in the United States and Canada (NatureServe 2025).*

New Jersey is one of the states where *Dichanthelium tenue* 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. *D. tenue* 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).

During the early 1900s a number of specimens collected in three southern New Jersey counties by Otway Brown, Robert Dreisbach, Bayard Long, and Witmer Stone were labeled as *Panicum trifolium*—the first of those was obtained by Stone in 1917 (Mid-Atlantic Herbaria 2025). *Panicum trifolium* is now viewed as a synonym of *Dichanthelium tenue* (POWO 2025) and the specimens have been reclassified accordingly. Only one of those potential historical occurrences is tracked by the Natural Heritage Program. There are two extant occurrences of *D. tenue* in the state and both were discovered during the current century (NJNHP 2024).

## Threats

No widespread threats to *Dichanthelium tenue* have been identified. Some populations may decline as a result of natural succession, which was noted as a concern at one New Jersey site (NJNHP 2024). However, the species appears to be fairly tolerant of shading, as discussed in the Habitat section. *Dichanthelium tenue* is commonly found in locations where the hemiparasitic Chaffseed (*Schwalbea americana*) grows. Helton et al. (2000) demonstrated that *Schwalbea* can parasitize *D. tenue*, although the grass is not a preferred host species, and *S. americana* has also been observed parasitizing *Dichanthelium tenue* plants in the wild (Fuller 2016). On the whole, the hemiparasite does not pose a significant threat to *D. tenue* because *S. americana* is extremely rare throughout its range (NatureServe 2025) and the grass is also able to utilize other habitats where Chaffseed does not occur. Rosenkranz (1987) reported that *Dichanthelium tenue* was susceptible to Maize Dwarf Mosaic Virus and Sugarcane Mosaic Virus when deliberately inoculated, but no reports of the diseases in natural populations of the rosette-grass were found.

## Climate Change Vulnerability

Information from the references cited in this profile was used to evaluate the vulnerability of New Jersey's *Dichanthelium tenue* 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 climactic conditions in accordance with the guidelines described by Young et al. (2016) and the state climactic computations by Ring et al. (2013). Based on available data *D. tenue* 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.

Shifting climactic conditions in New Jersey are resulting in higher temperatures, more frequent and intense precipitation events, and increasing periods of drought (Hill et al. 2020). As a southern species, *Dichanthelium tenue* can be expected to withstand rising temperatures in the state: The grass was once thought to reach the northern edge of its range in North Carolina (Duke 1961) and occurrences north of that state are rare (see Figure 3). It is possible that warming trends could facilitate a northward expansion of the species' range, although the rate of movement would probably be limited by its dispersal capabilities. *D. tenue* might also be able to withstand more extreme weather events that increase the frequency of floods and droughts. The species is tolerant of occasional inundation in coastal and inland locations (Luken and Bezold 2000, Battaglia 2016) and is capable of thriving in xeric or subxeric conditions (Drew et al. 1998, Carr et al. 2010).

## Management Summary and Recommendations

One of New Jersey's two extant *Dichanthelium tenue* populations has never been formally assessed and a need for additional surveys to evaluate the long-term viability of the other population has been noted. Suitable habitat may still be present at the site of a historical occurrence that does not appear to have been revisited since a collection was made there a

century ago (NJNHP 2024). In addition to monitoring the status of populations, site visits provide an opportunity to examine the condition of *D. tenue* habitats. In the absence of natural disturbances some occurrences might be aided by management activities that promote a more open canopy. In the southern United States *Dichanthelium tenue* appears to benefit from a biennial burning regime with fires conducted during the latter part of winter (Gilliam et al. 2006, McFarland et al. 2020). Depending on local site conditions, selective removal of woody plants might be sufficient to maintain viable populations of the grass.

Additional research on *Dichanthelium tenue* could foster a more comprehensive understanding of the ways in which the grass interacts with other species and with its environment. It would be useful to know how long individual plants typically live and the length of time their seeds can remain viable. There is a lack of information regarding both the germination and establishment requirements of *D. tenue* and its ability to compete with other herbaceous plants. Identification of the factors that have historically defined the northern range limit of *Dichanthelium tenue* would allow managers in mid-Atlantic states to develop more effective conservation plans for the species as the climate continues to warm.

## Synonyms

The accepted botanical name of the species is *Dichanthelium tenue* (Muhl.) Freckmann & Lelong. Orthographic variants, synonyms, and common names are listed below (ITIS 2025, POWO 2025, USDA NRCS 2025b). Although Freckmann and Lelong (2002) published the name *D. tenue* more than two decades ago, a number of current sources still identify the grass as a variety of *Dichanthelium dichotomum*. However, a recent analysis by Majure et al. (2024) indicated that *D. dichotomum* and *D. tenue* are not closely related and supported the identity of *D. tenue* as a species.

| **Botanical Synonyms** | **Common Names** |
|---|---|
| *Dichanthelium dichotomum* var. *tenue* (Muhl.) Gould & C. A. Clark | White-edge Panic Grass |
| *Dichanthelium dichotomum* var. *unciphyllum* (Trin.) Davidse | Cypress Panicgrass |
| *Dichanthelium albomaculatum* (Scribn.) Gould | White-edged Witchgrass |
| *Dichanthelium ensifolium* var. *unciphyllum* (Trin.) B. F. Hansen & Wunderlin | Slender Panicum |
| *Panicum acuminatum* var. *unciphyllum* (Trin.) Lelong | |
| *Panicum albomaculatum* Scribn. | |
| *Panicum albomarginatum* Nash | |
| *Panicum concinnius* Hitchc. & Chase | |
| *Panicum dichotomum* var. *tenue* (Muhl.) C. F. Reed | |
| *Panicum dichotomum* var. *unciphyllum* (Trin.) Wipff & S. D. Jones | |
| *Panicum tenue* Muhl. | |
| *Panicum trifolium* Nash | |
| *Panicum unciphyllum* Trin. | |

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