

Dichanthelium longiligulatum

Coastal-plain Panic Grass

Poaceae



Dichanthelium longiligulatum by Theo Witsell, 2021

Dichanthelium longiligulatum 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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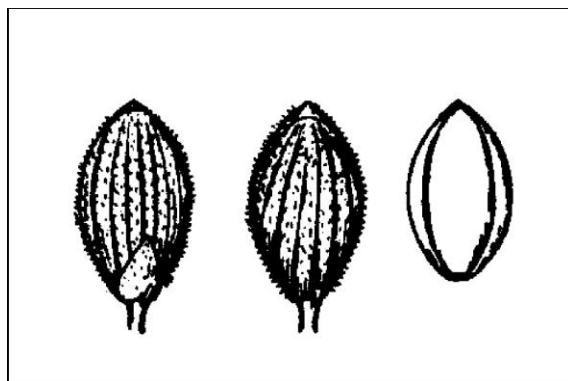
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Life History

Dichanthelium longiligulatum (Coastal-plain 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). Although C₄ photosynthesis is common in the grass family and typical in *Panicum*, all species of *Dichanthelium* use the C₃ photosynthetic pathway (Brown and Smith 1975, Gould and Clark 1978).



Left: Theo Witsell, 2021. Top right: Hitchcock 1950, courtesy USDA NRCS 2025a. Bottom right: Claire Ciafré, 2018.

The vernal culms of *Dichanthelium longiligulatum* are 3–7 dm high. The stems and sheaths are smooth, and the sheaths are usually shorter than the internodes. The leaves are 4–8 cm long, 4–8 mm wide, and smooth above with fine, short hairs on the underside. The ligules are 2–3 mm in length. The densely-flowered panicles are 3–8 cm long and ovoid with stiff ascending branches, and the pubescent spikelets are 1.1–1.2 mm long and 0.7 mm wide. The autumnal culms usually recline and branch profusely from the nodes, producing more compact tufts. The leaves are

green to purple and their edges roll inward slightly. (See Hitchcock and Chase 1910, Hitchcock 1950, Gould and Clark 1978, Barkworth 2021). The potential blooming period for Coastal-plain Panic Grass extends from May to September (Callahan 2021, Weakley et al. 2021).

Dichanthelium longiligulatum is associated with a complex of closely related and structurally similar grasses, many of which also occur in New Jersey (see Synonyms and Taxonomy section), so attention to detail is needed when making an identification. *D. longiligulatum* is most likely to be confused with *D. acuminatum* var. *lindheimeri*, *D. spretum*, or *D. leucothrix* and it often shares habitat with the latter species. *D. leucothrix* usually has hairy lower culms and sheaths but less pubescent specimens can be misleading. Both *D. acuminatum* var. *lindheimeri* and *D. spretum* resemble *D. longiligulatum* in having smooth lower culms and sheaths but those species have slightly larger spikelets; also, *D. acuminatum* var. *lindheimeri* is usually taller and the panicles of *D. spretum* are more congested (Hitchcock and Chase 1910, Freckmann 1981, Lelong 1984, Barkworth 2021, Majure et al. 2024). Plants that are intermediate in form between *D. longiligulatum* and *D. spretum* have been reported (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 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). The 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 have no evident 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 distributed 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 1957) and *Dichanthelium* seeds are favored by wintering sparrows (Bechtold and Stouffer 2005, 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 obtained from deer pellets was reported by Pile et al. (2015) and Flaherty et al. (2017).

Seed banking has been documented in many other rosette grasses, including *Dichanthelium acuminatum* (Cohen et al. 2004, Martin 2006, Stuble 2008), but it is not clear how long *D. longiligulatum* seeds can remain viable in the soil and no information was found regarding the species' germination requirements. Mycorrhizal relationships have been reported in other North American members of the genus, including one in the *D. acuminatum* complex, but there is no evidence that they are necessary for establishment (Wilson and Hartnett 1998, Bunn and Zabinski 2003).

Habitat

Dichanthelium longiligulatum usually inhabits coastal plain lowlands (Hitchcock and Chase 1910) although it has been found in mountain bogs at elevations up to 540 meters above sea level (Uttal and Mitchell 1972, Buhlmann et al. 1999). Typical habitats include savannas, flatwoods, bogs, swamps, low wet meadows, and ponds (Sieren and Warr 1992, Bechtold and Stouffer 2005, Callahan 2021, Soteropoulos et al. 2022, Weakley et al. 2024). Some of the wetlands experience seasonal fluctuations in water levels (Smith 1996, McAvoy et al. 2015, Thomas 2017) but others remain saturated year round (Wofford et al. 1979). New Jersey's extant population is situated on the bank of a creek in a sunny gap in a *Chamaecyparis thyoides* (Atlantic White Cedar) swamp (NJNHP 2024). *D. longiligulatum* sometimes utilizes wetland habitats in sites that have been altered by human activity such as cutover woodlands or utility corridors (Penfound and Watkins 1937, Shelingoski et al. 2005), and Luken (2005) listed it as an indicator species for mowed and cleared plots in Carolina Bay restorations.

The community composition in sites utilized by *Dichanthelium longiligulatum* can vary considerably. Some sites are nutrient-poor and include a number of carnivorous plants such as *Dionaea*, *Drosera*, *Sarracenia*, or *Utricularia* species. Some are open and herb-dominated while others have a fairly well-developed canopy and/or shrub layer (Pullen and Plummer 1964, Eleuterius and Jones 1969, Luken 2005, Carr et al. 2010, Callahan 2021, Soteropoulos et al. 2022). The grass appears to be a generalist in terms of shade tolerance but it is likely to grow and reproduce more vigorously in sites with plenty of available light (Szakacs et al. 2022, Weakley et al. 2024).

Wetland Indicator Status

Dichanthelium longiligulatum is not included on the National Wetlands Plant List (NWPL). While absence from the list often means a species favors upland habitats, in this case it may be a

matter of nomenclature. Some botanists treat *D. longiligulatum* as a subspecies or variety of *D. acuminatum*, which is facultative in New Jersey (U. S. Army Corps of Engineers 2022). According to Weakley et al. (2024), *D. longiligulatum* is either a facultative species or a facultative wetland species throughout its range, meaning that it may occur in wetlands or nonwetlands but in some places it is more likely to be found in wetlands.

USDA Plants Code (USDA, NRCS 2025b)

DILO4

Coefficient of Conservancy (Walz et al. 2020)

CoC = 8. 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 native range of *Dichanthelium longiligulatum* extends from the eastern and central United States to northern South America, including some parts of the Caribbean (Barkworth 2021, POWO 2025). The map in Figure 1 depicts the extent of the species in the United States. Pennsylvania has sometimes been included in its range (e.g. Hitchcock 1950, Gould and Clark 1978).

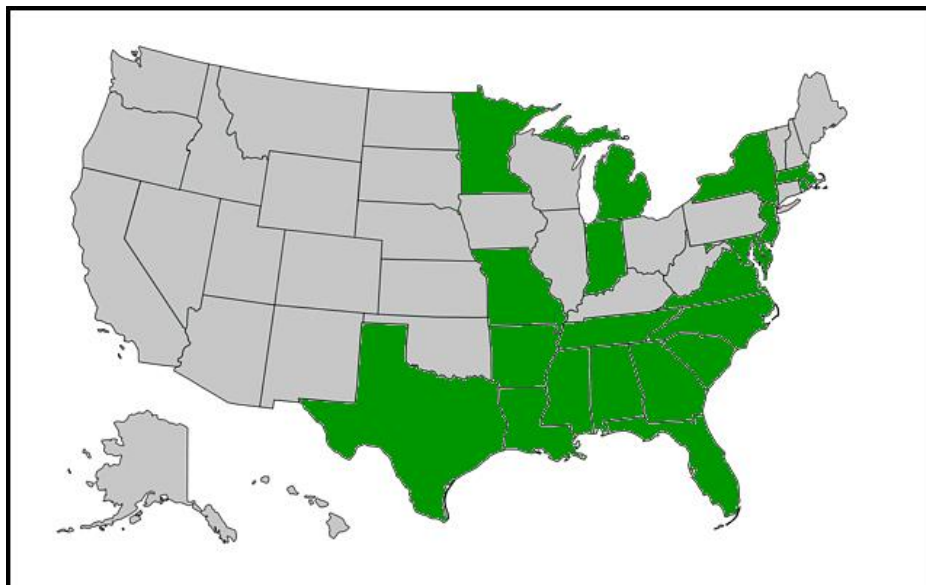


Figure 1. Distribution of *D. longiligulatum* in the United States (source data from POWO 2025).

There are credible records of *Dichanthelium longiligulatum* from four New Jersey counties: Atlantic, Burlington, Cape May, and Ocean (Figure 2 below), but only one is current. A few old reports from other counties have not been confirmed.

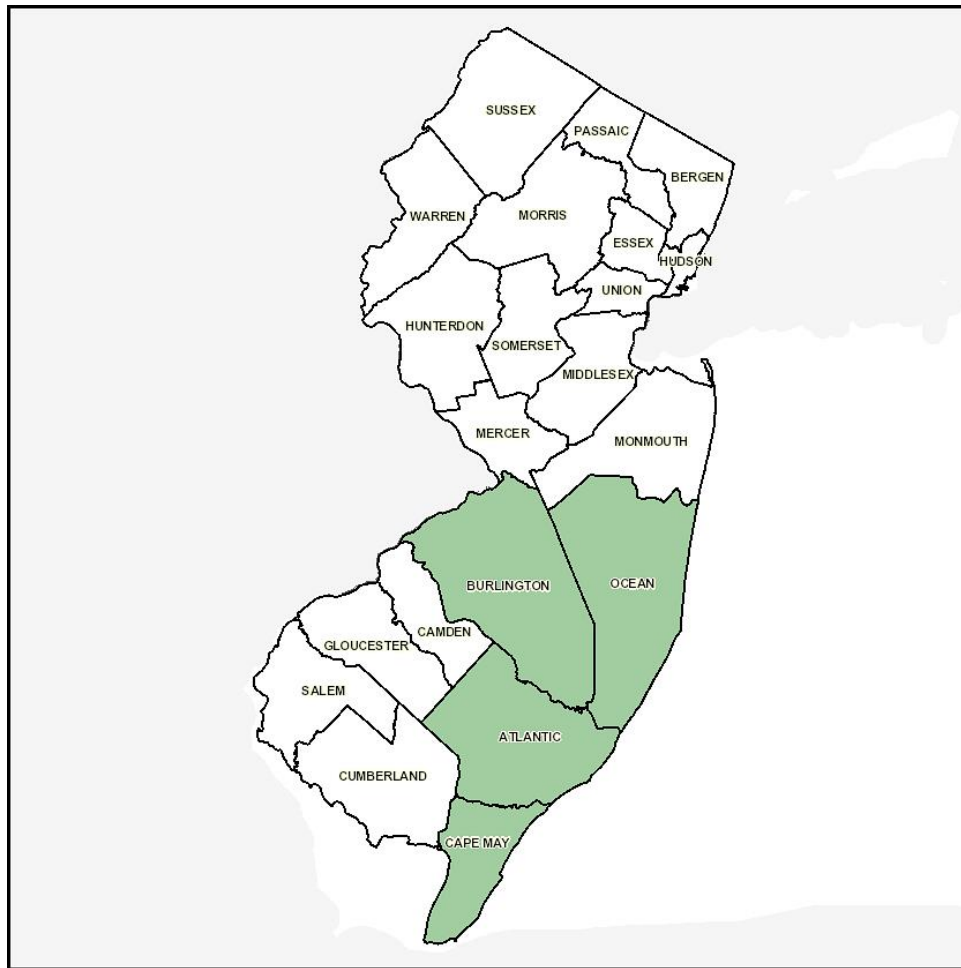


Figure 2. County records of *D. longiligulatum* in New Jersey (source data from NJNHP 2024 and Mid-Atlantic Herbaria 2025).

Conservation Status

Dichanthelium longiligulatum has a global rank of G4G5Q, meaning there is some uncertainty as to whether it should be considered apparently secure or secure. 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. The Q indicates that the global status is in need of a review (NatureServe 2025). The map below (Figure 3) illustrates the conservation status of *Dichanthelium longiligulatum* in the United States and Canada. The grass is vulnerable (moderate risk of extinction) in three states, imperiled (high risk of extinction) in one state, and critically imperiled (very high risk of extinction) in one state. In most of the states where it occurs it is unranked or apparently secure. *D. longiligulatum* has been introduced into one Canadian province.

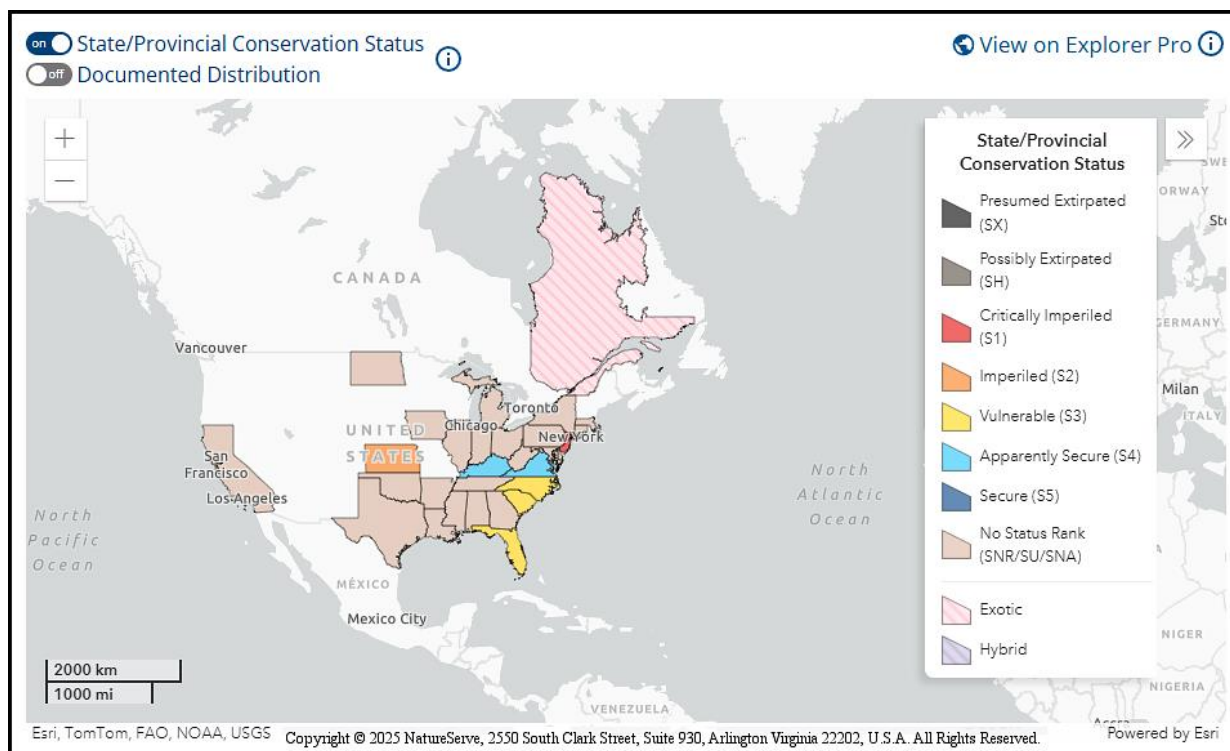


Figure 3. Conservation status of *D. longiligulatum* in the United States and Canada (NatureServe 2025).

New Jersey is the state where *Dichanthelium longiligulatum* 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. longiligulatum* 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 the grass 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).

Dichanthelium longiligulatum was initially listed as SH.1, indicating that it was a historical species that had only been documented at a single location in the state (NJNHP 2001). The status was changed to S1 after a population was discovered by Robert Moyer in 2020, and that remains the only known extant occurrence (NJNHP 2024).

Threats

No widespread threats to *Dichanthelium longiligulatum* have been reported. The small size of New Jersey's population makes it particularly vulnerable to random events: Only three plants were seen during two site visits in 2020. Beavers (*Castor canadensis*) are already active along

the creek where the grass is situated and construction of a new dam downstream could inundate the site that is presently occupied by the occurrence (NJNHP 2024).

Climate Change Vulnerability

Information from the references cited in this profile was used to evaluate the vulnerability of New Jersey's *Dichanthelium longiligulatum* 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 *D. longiligulatum* 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.

As a result of climate change, plant communities in New Jersey are experiencing higher temperatures, more frequent and intense precipitation events, and increasing periods of drought (Hill et al. 2020). The global distribution of Coastal-plain Panic Grass indicates that it has the capacity to withstand warmer conditions, and since it can occupy habitats where water levels fluctuate it may have some tolerance for short periods of drought or flooding. Extended droughts are likely to limit its reproductive capacity. *Dichanthelium* species are susceptible to water stress and may abort spikelets or even entire panicles in response to drying, depending on the timing of the event (Spellenberg 1975). Experimental work with *D. clandestinum* demonstrated that a decrease in soil moisture reduced both cleistogamous reproduction and total biomass of the plants (Bell and Quinn 1987). It is not clear whether *D. longiligulatum* maintains a sufficient seed bank to withstand a lengthy period of suboptimal growing conditions.

Management Summary and Recommendations

As discussed in the section that follows, the taxonomic status of *Dichanthelium longiligulatum* has not been completely resolved. During the past half century most of the research on *D. longiligulatum* and closely associated species has been focused on evaluating the relationships between members of the group based on physical attributes ranging from general morphology to DNA. As important as it is to resolve those questions, a greater emphasis on how the grasses interact with their environments might shed some additional light on their commonalities and differences and would also be helpful in planning for the long-term conservation of the rarer taxa.

Synonyms and Taxonomy

The accepted botanical name of the species is *Dichanthelium longiligulatum* (Nash) Freckmann. Some orthographic variants, synonyms, and common names are listed below (POWO 2025, USDA NRCS 2025b).

Botanical Synonyms

Dichanthelium acuminatum var. *longiligulatum*
(Nash) Gould & C.A. Clark
Dichanthelium acuminatum ssp. *longiligulatum*
(Nash) Freckmann & Lelong
Panicum acuminatum var. *longiligulatum* (Nash) Lelong
Panicum longiligulatum Nash
Panicum spretum var. *longiligulatum* (Nash) D. B. Ward

Common Names

Coastal-plain Panic Grass
Coastal Plain Witchgrass
Long-ligule Witchgrass

Panicum longiligulatum was first described by Nash (1899) based on a specimen that had been collected by George Vasey in Florida a few years earlier. That name was used by Hitchcock and Chase (1910), who placed it in *Panicum* Subgenus *Dichanthelium*. It was omitted by Fernald (1950), although the Manual of Grasses of the United States that was published the same year indicated that its range extended north to Delaware and southeastern Pennsylvania (Hitchcock 1950). *Dichanthelium* was elevated to genus level by Gould (1974), and a subsequent revision of that group reclassified Coastal-plain Panic Grass as *Dichanthelium acuminatum* var. *longiligulatum* (Gould and Clark 1978). That name is currently recognized by ITIS (2025).

Freckmann (1981) reestablished Coastal-plain Panic Grass as a species when he published the name *Dichanthelium longiligulatum*. Although Lelong (1984) took a similar view to that of Gould and Clark (1978), he had his doubts about the validity of *Dichanthelium* as a genus and classified it as *Panicum acuminatum* var. *longiligulatum* instead. Hansen and Wunderlin (1988) treated *Dichanthelium longiligulatum* as a synonym of *D. leucothrix*: They noted that there might be some basis for identifying it as a variety of that species but chose not to do so. It is also viewed as a synonym of *D. leucothrix* by Kartesz (2015). Gleason and Cronquist (1991) listed *Panicum longiligulatum* as a synonym of *P. lanuginosum* var. *lindheimeri*. Freckmann and Lelong (2002) redescribed it as a subtaxon of *D. acuminatum* but made it a subspecies instead of a variety. Their name—*Dichanthelium acuminatum* ssp. *longiligulatum*—is currently utilized in Flora of North America, where 10 subspecies of *D. acuminatum* are recognized* (Barkworth 2021). Ward (2012) took a different tack, once again returning *Dichanthelium* to subgeneric rank and identifying *D. longiligulatum* as a variety of *Panicum spretum*.

Thomas (2015) acknowledged the longstanding confusion and debate regarding the taxonomy of Coastal-plain Panic Grass and its apparent close relatives, but he believed that "*taxonomists are obligated to err on the side of caution and maintain such taxa as species until we better understand their significance rather than learn too late that we too eagerly dismissed their uniqueness.*" Thus he chose to restore *Dichanthelium longiligulatum*, and the name is presently accepted by Weakley et al. (2024), NatureServe (2025), POWO (2025), and USDA NRCS (2025b). But that is not the end of the story. Recent phylogenetic analyses of the relationships among North American *Dichanthelium* species indicated that the troublesome *D. acuminatum* complex was polyphyletic and that *D. longiligulatum* was nested within *D. leucothrix* (Majure et

*The subspecies include *acuminatum*, *columbianum*, *fasciculatum*, *implicatum*, *leucothrix*, *lindheimeri*, *longiligulatum*, *sericeum*, *spretum*, and *thermale*. All but two have been reported in New Jersey.

al. 2024). Consequently, the authors have proposed that the grass be renamed as *Dichanthelium leucothrix* ssp. *longiligulatum* (Nash) Majure.

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